J.J.M.L. MARCHAND

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BY

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PREFACE

I have been asked by the author to write a preface to this book, either by way of explanation or criticism. After reading and rereading his manuscript, however, my only objection to complying with his request is that there is little for me to explain or criticize. I shall therefore restrict myself to writing a somewhat general preface.

The fact that this booklet is to appear in five languages — in the author's mother tongue, as well as in English, French, German, and Spanish — indicates that it is intended for distribution all over the world, and as far as I can judge there are few countries, if any, that would not benefit from studying the observations made in it. I mention countries, and not postal authorities, because it contains useful hints not only for the latter, but also for other Government institutions, banks, department stores, in short all establishments with offices or workshops of some size, especially where sorting or bundling work is done.

Some twenty years ago my former activities as Chief Inspector of the Netherlands Postal Service brought me into touch with the various problems dealt with in this book. To a certain extent and as far as the means at my disposal would allow, I was able to translate some of the author's ideas into practice, occasionally making use of what I had seen during my official tours in other countries in and outside Europe.

This implies that not everything contained in this booklet is new, either abroad or in this country. On the other hand I am convinced that many of those who are responsible and many governments will not only study it, but also apply its contents to better serving the interests entrusted to their care.

The very attractive get-up of the publication renders superfluous any recommendation on my part to give it serious attention. The book primarily aims at laying down general standards of efficiency for the organization of a modern office, in particular of an up-to-date Post-Office. The author is justified in drawing special attention to the Transorma. The handling of incoming and outgoing mail always remains the main task of the Postal Service. Appliances used for accomplishing

that task in the most effective manner are, therefore, entitled to the place of honour.

Successful as, in my opinion, the writer has been in dealing with general standards of efficiency, the excellent description of his own inventions, children of his brain and zeal, deserves special mention.

Should there be any point about which the reader would like further information, Mr. Marchand is always prepared to furnish it, not only in his capacity as author, but more especially as Manager of the Marchand-Andriessen Engineering Company at The Hague. The firm undertakes to advise those interested in sorting problems and to devise plans for the organization of sorting plants.

I hope that perusal of this booklet will induce wide-spread advantage to be taken of this opportunity, resulting in a large-scale adoption of the aids and appliances recommended by the author to the benefit of the Postal Service, to which — I trust not without some success — I have devoted the forty-five best years of my life, and in which I hope to continue to take an interest during my remaining years.

Finally, I cordially avail myself of this unique opportunity to send a greeting to the numerous members of the international postal fellowship, especially those whom I so often had the privilege of meeting during my official tours, and above all at conferences and congresses, and in whose company I have spent so many memorable hours.

(A. P. F. DUYNSTEE)

The Hague, November 25th, 1945.

CHAPTER I

"THE OLD ORDER CHANGETH"....

We make no attempt here to present a history of the Post, even in the form of a bird's-eye review. We are going to ignore the Persian and Roman State services, which were not intended for the use of the general public, and the services organised by monks, craftsmen, butchers, merchants, universities and municipalities for the conveyance of letters. And so we come to the beginning of the XVIth century, when the well-known family of Thurn und Taxis organised and operated the postal services of the Habsburgs, Italy and the Spanish Netherlands, and retained control of the Post in Germany until the latter half of the XIXth century (1866).

By this time the first International Postal Conference was held at Paris in 1863. Its aim was to make for uniformity in the operation of international services and, with this object in view, it drew up the 31 articles, which have now become famous. Many countries had already introduced a uniform postage-rate for inland letters.

It is not easy for us to realise exactly what this means. Suffice it to say that in the middle of the XIXth century there were in France, for example, eleven tariff zones, and the average postage on a letter there amounted to 43 gold centimes. A letter weighing 15 grammes, sent from Paris to Marseilles, cost no less than 2.20 gold francs.

In this connection the name of Rowland Hill and his pamphlet "Post-Office Reform, Its Importance and Practicability", have become world famous. A few years ago the centenary commemorating the introduction of a uniform rate of postage and the postage stamp was celebrated not only in England, but in other countries as well.

All the same it is somewhat doubtful whether the scheme can be entirely ascribed to Hill, for it was to be found in an elementary form in the Kingdom of Sardinia as early as 1819, and there are some traces of its operation in Paris as far back as under Louis XIV.

Our summary of events has unwittingly led us to trespass upon the domain of history, but we cannot refrain from making a brief reference to some of the most important factors that have revolutionized the postal service: the invention of printing; the discovery and exploitation of

distant countries; the great increase in population, especially in large cities; the immense possibilities opened up by mechanised sea-, rail-, road-, and air-transport, and scientific progress in general. All this has naturally had a vital effect on the development of the Post, which has to cope with the conveyance of approximately 200 million articles posted daily all over the world, and inevitably demands efficient organisation employing the latest scientific contrivances. This was achieved slowly and with difficulty in the face of persistent opposition. "Nil novum sub sole".

There have always been people who have tried to stem the course of events with high-sounding slogans; nor are they always actuated by ill will. Their motives were, and are still, often bona fide, but their numbers are increased by others, who oppose change through spite, or from fear of losing their means of livelihood.

Moreover, most people are still inclined to look with disfavour upon anything new that falls outside the scope of their limited experience, and regard those advocating change as impractical, rash, or even as a danger to the community. We well remember the time when able and experienced public servants in responsible positions opposed the conveyance of post by motorvehicle, and for various reasons vetoed air transport as unsuitable.

Objections were even raised against the use of the harmless bicycle for deliveries of post in the rural districts of a flat country. In the country, they argued, it was not speed that counted, but regularity; and that they considered could never be achieved with a bicycle. Nowadays, in that very same country all deliveries in rural districts are made by postmen on bicycles.

Nevertheless, improvements made during the past century mainly affected *the conveyance of mail once it left the post office*. The reason for this is obvious. New ways of speeding up ordinary traffic had been devised, and in the long run it was out of the question for the Post to avoid using improved transport facilities, in view of the urgent demand to minimize delay. From every point of view, the time saved was too great to brook complacency.

When a letter has to be carried some hundreds of miles and one means of transport averages 6 miles per hour, whilst another can cover between 30 to 60 miles per hour, it seems to make but little difference whether an hour longer or less is spent on preparations before dispatch or after receipt at the office of destination.

Not that this point has been overlooked by those responsible, but here, too, rationalization and efficiency are comparatively recent conceptions.

As a result of the World War 1914-1918, however, efforts were directed towards finding the best methods of working the service, by making the most efficient use of labour and speeding up its operation. Much has been achieved in this direction through many of the measures adopted by the Post and in this connection we refer to its first and foremost task: the conveyance of letters and other postal-matter.

Stamp-cancelling machines had already been in use for some years and have gradually attained a high degree of perfection. Chutes, lifts, belt-conveyors and improved sorting-cases were introduced and attempts were made to accelerate the process of sorting, but sorting continued to be done *by hand.*

Sometimes contrivances which partially succeeded in transporting mail automatically, were offered under the name of "sorting machines", but all these actually did was merely to convey from one place to another mail which had already been sorted into cases in the customary way by hand. They were in fact ordinary sorting-cases, divided into a number of compartments or pigeon-holes with movable bottoms. For technical reasons these compartments were small and above all shallow, so that postal-matter had to be placed in them with care, and the sorting itself often took much longer than when an ordinary sorting-case was used.

The Netherlands were the country in which a genuine sorting-machine first materialised, and the following chapters explain in detail how co-operation between the Postal Service of the Netherlands and private enterprise produced a sorting machine really worthy of that name. *The postal service being in the nature of a monopoly, its duty to ensure the utmost efficiency and speed in the handling of mail is generally recognized, and it may undoubtedly be assumed that all authorities will objectively consider not only how mail can be most conveniently t r a n s p o r t e d, but also how and by what means it can be most effectively s o r t e d a n d f u r t h e r d e a l t w i t h in the various sorting offices.*

CHAPTER II

THE LONG UPHILL FIGHT

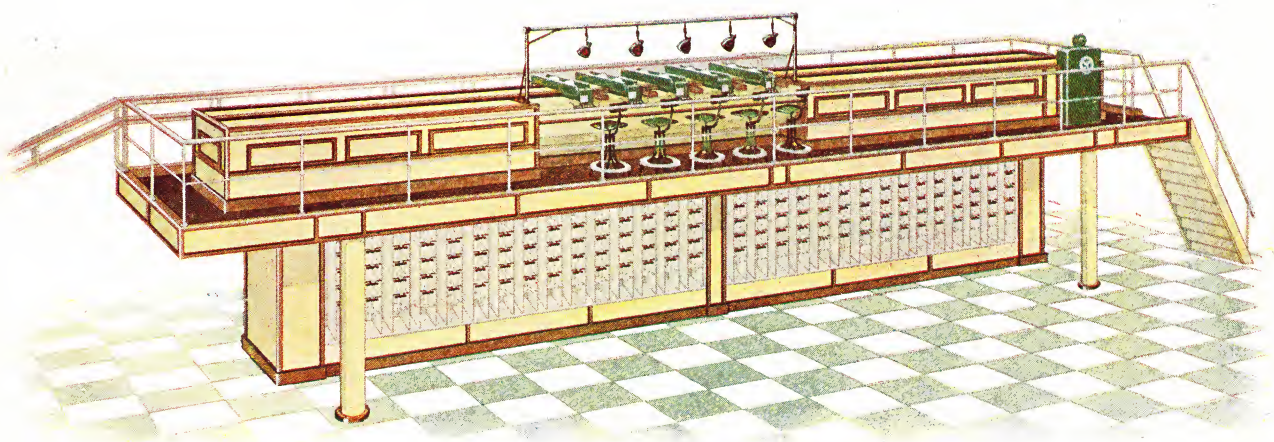
Reviewing my years of service in the Post, I now realise what a fortunate period of my life they represent. For, as will be seen from the following pages, they gave me the opportunity of solving a problem which had baffled all my predecessors.

My postal career, like that of many of my former colleagues, involved frequent transfers from place to place; and although I did not at the time always welcome this continual uprooting, on looking back, I recognise the advantages it entailed. The Money-Order Department, the Parcel Post, the Postal-Cheque and Money-Transfer Department, then in its infancy, but above all the Dispatch- and Delivery-Departments, were branches of the service in which I was successively placed. I did dispatch work in several important Post Offices and on the international mail-trains, and later, as a senior official, supervised such work. Was it by mere chance that I was most frequently employed in these departments, or was my employment there due to the special interest I took in that line? I cannot tell; perhaps both factors were involved.

The methods of sorting then adopted were far from efficient, and the equipment used was not, in my view, designed to ensure the most economical operation. The work was tiring, especially because of the long hours of standing it necessitated, but this, too, was accepted as a matter of course and part of the job.

My duties on international mail-trains brought me into contact with foreign colleagues. Whenever an opportunity presented itself, I questioned them about the methods employed in their countries in the hope of gaining fresh ideas. But in vain! The same cumbrous methods prevailed everywhere. All regarded standing at the sorting-cases, and the consequent fatigue that soon resulted therefrom as unavoidable. I began to wonder whether indeed there was no other possible alternative. Why, I asked myself, has mail to pass through the sorter's hands two or three times before it is finally sorted for dispatch to its destination? The answer was pretty simple: because the number of sections into which the mail was, or could be divided in the first round of sorting was too small.

2. Transorma Sorting Machine Type A 5/300 (1944, front view).



I attempted to plan a type of sorting-case which would contain more pigeon-holes for holding sorted mail, but the deeper I went into the matter, the clearer it became to me that I was not on the right track. If the number of pigeon-holes in a sorting-case were increased, the sorter would have to extend his reach, walk to and fro, stoop, stretch his arms; and though the result would indeed be fewer rounds of sorting, the extra strain imposed on the sorter would hasten fatigue. This would so adversely affect the speed of sorting that the change would bring little or no improvement.

Thus another solution had to be sought. I thought the matter over for years, and gradually began to wonder whether it would not be possible to construct a machine that would to a great extent mechanize the manual labour. After much experimenting with the limited means at my disposal, I thought that I had at last hit on a machine that was capable of doing what I wanted. I applied for and obtained a patent, but no sorting-machine of that type was ever actually built, for further tests proved that it had serious defects, amongst which not the least was that it worked too slowly. This was partly due to the fact that I was aiming at a machine which would arrange, cancel, and sort the mail in the course of one operation. Later experience taught me that I had overshot the mark. Stamp-cancelling could be done perfectly well and much more rapidly by existing stamp-cancelling machines.

The arranging or stacking and facing of letters, however, greatly hampered the speed of sorting. It is still my ambition to design a suitable machine for this purpose, to operate independently of the sorting-machine.

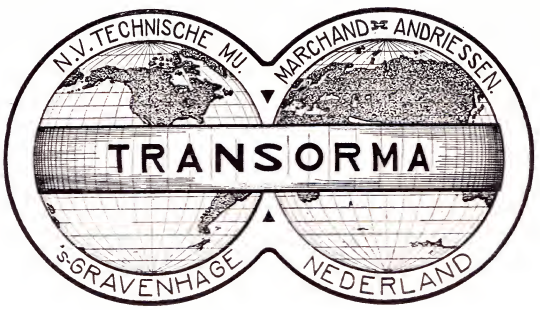
Meanwhile, I had been transferred from the Postal Train Service to the Board of the Postal, Telegraph, and Telephone Services, where I was put in charge of the department which checked cashed money-orders. Here too, where much sorting had to be done, I again had ample opportunity of studying the subject in which I took so keen an interest, but my time being fully occupied with my official duties, I had little chance of improving my invention.

Moreover, my experiments had gradually reached a stage when progress required more technical knowledge than I possessed. So I decided to give up my official career in order to be able to devote myself entirely to perfecting my invention, and sought to secure the assistance of a trained technician. In this I succeeded, for the late Professor

J. C. Andriessen of the Technical College at Delft was prepared to enter into partnership with me, and we founded the Marchand-Andriessen Engineering Company.

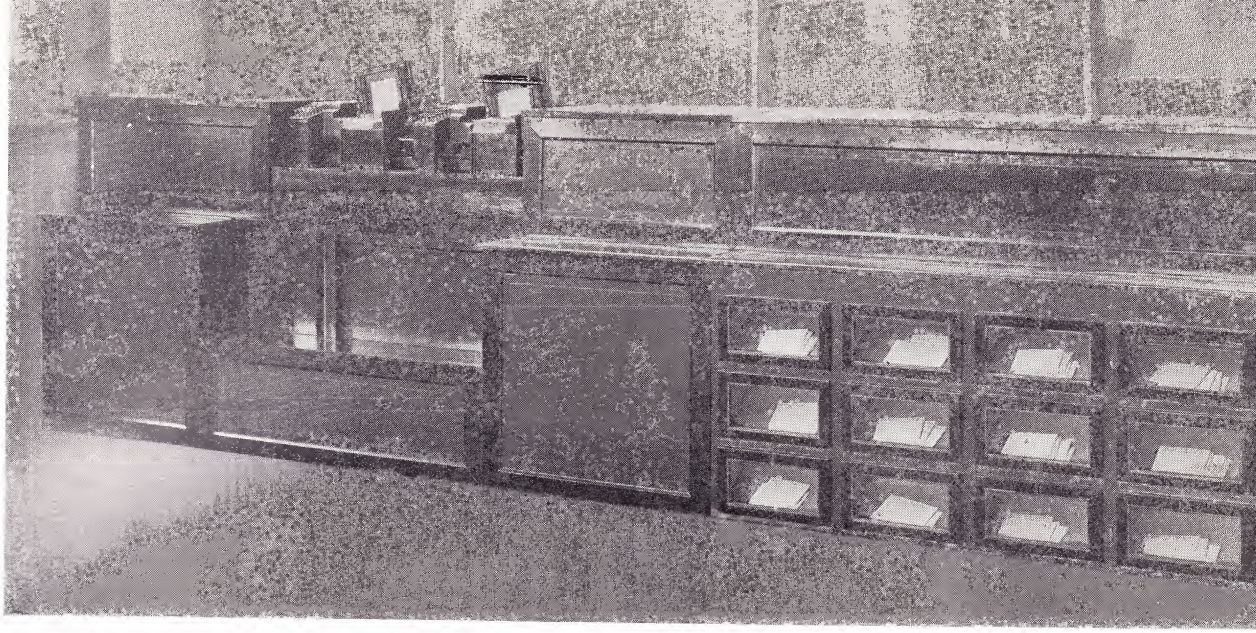
The period which followed was one of close co-operation between us. Professor Andriessen was ingenious enough to meet all my demands, and after some time we succeeded in constructing a mechanism which inspired me with sufficient confidence to decide to demonstrate it to postal authorities at the earliest opportunity.

In 1927 an International Aero-postal Conference was held at The Hague, at which twenty-two European and thirteen non-European countries were represented by distinguished postal officials, and I decided to avail myself of so rare a chance. Invitations were sent to all the delegates to attend a demonstration of the "Transorma" Sorting Machine (fig. 1). This was the name chosen with a view to suggesting that it was a machine which simultaneously *trans*ported and *sor*ted mail, and has been designed by the *M*archand-*A*ndriessen Engineering Company.



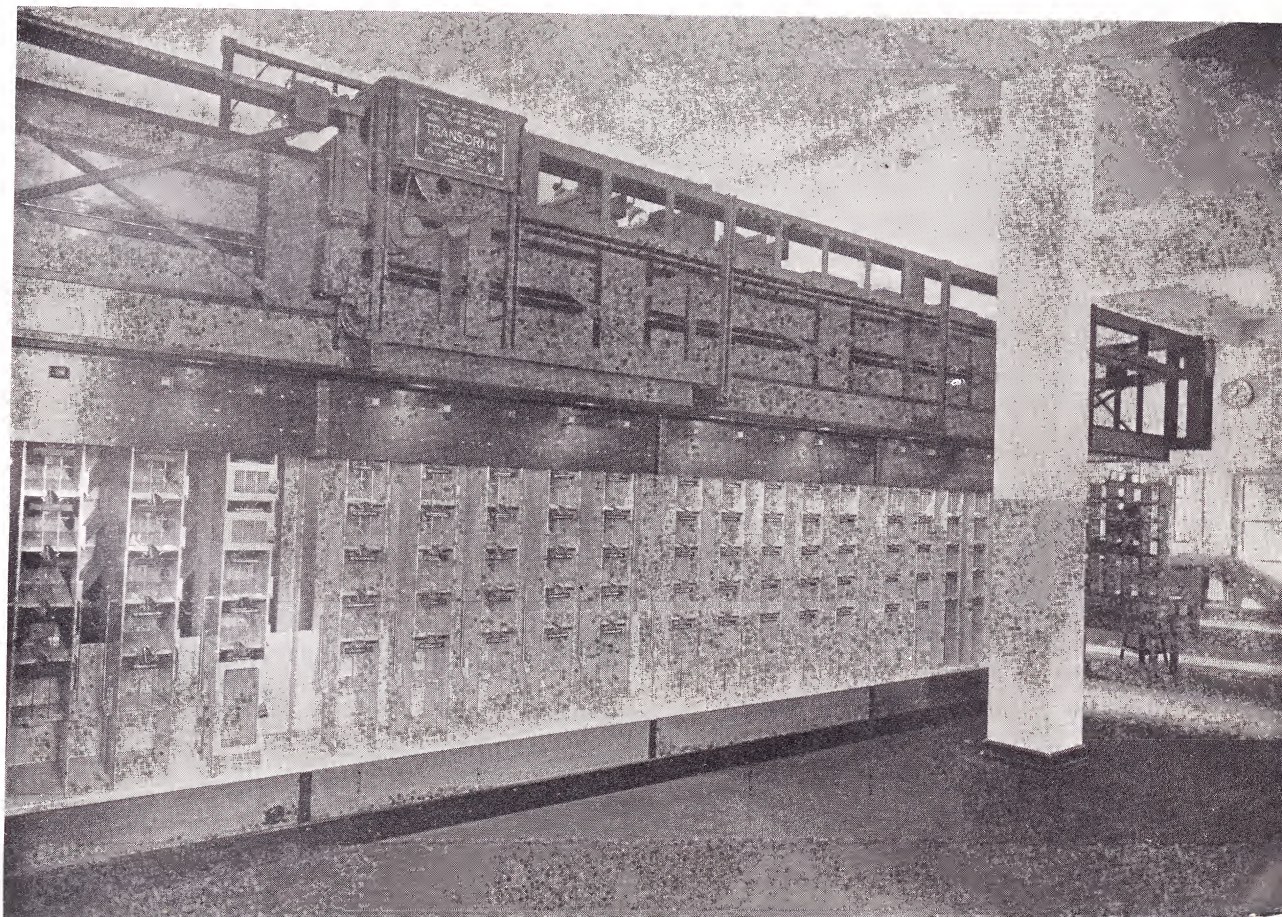
Most of the delegates attended the demonstration: they asked many questions, showed great interest, and highly praised the working of the machine. But the main thing as far as I was concerned — an order for the supply of one or more machines for the postal service of their countries — did not materialise. This was a serious disappointment, for it was high time that some form of revenue was found for the Company. Protracted experiments and the construction of the machine had cost a great deal of money, which had been paid from our own pockets.

Nevertheless I did not lose heart, and tried to secure an order for a Transorma Sorting Machine from the Netherlands Postal Service. Great was my joy when, after long negotiations and repeated demonstrations, a machine was ordered for the dispatch service at Rotterdam.



1. The First Transorma Sorting Machine (1927).

3. Transorma Sorting Machine Type A 5/300 (1944) (rear view).



At last our sorting-machine would have its chance! I was convinced that in practice it would fully come up to my expectations, and the following months showed that my confidence had not been misplaced.The machine proved to be a success, and it may be imagined how great a satisfaction it was to me to see that first machine, a product of twenty years of study and experimentation, actually in operation in a Netherlands Post Office.

Its success was so great that the Netherlands Postal Service ordered a second machine. Its high sorting speed was not the least important factor which contributed to this decision. The sorting capacity of the trial machine amounted to 2,000 articles per hour per operator; the machines supplied could per hour sort at a speed of 3,000 articles per operator. Both machines were built by Werkspoor Ltd., of Amsterdam, which Company later acquired world rights for the manufacture of Transorma Sorting and Bundling Machines.

Certain imperfections in the first machine became apparent from its use: the receptacles, for instance, had been arranged in a horizontal plane, causing some inconvenience when being emptied and it was found more practical to arrange them in a vertical plane. The second Transorma was built along these lines, whilst the first was altered accordingly. We trained the first group of "Transormists" appointed to operate the machine. Later on, after experience had been gained in this field, the Post Office undertook the training of subsequent operators.

Now that the way for the use of Transorma had been paved, it was somewhat easier to convince interested officials of the advantages the machine had to offer both as regards speed and economy. Moreover, it could actually be seen in operation at Rotterdam, and important officials from various countries came over to satisfy themselves of its value for their services.

Unfortunately currency difficulties and political complications often prevented the placing of orders; but where these factors were not involved, orders were received. Thus, two machines were successively installed at Brighton (United Kingdom), two at Rio de Janeiro (Brazil), one at Berlin-Steglitz, and one at Munich-Gladbach (Germany) (figs. 29 and 30). At the outbreak of war in 1940, negotiations were in progress with many countries for the supply of machines.

For more than ten years the machines at Rotterdam have proved their worth to the Postal Service. It may be safely assumed that during

that time they have effected economies repaying their cost several times over. Although originally destined for use in the Dispatch Department, they soon began to be used to sort incoming mail, which proved to be a still greater success.

When, as the result of the air raid on Rotterdam in May 1940, the machines were so badly damaged that their repair would have involved considerable expense, it was decided to replace them. In dismantling the old machines it was found that, in spite of more than ten years intensive use, they had suffered very little from wear and tear.

Postal traffic at Rotterdam having enormously decreased owing to the war, only one new machine was ordered for the Dispatch Department. This was placed in the Post Office temporarily installed at the Central Railway Station (fig. 11). In the Delivery Department, which remained at the Central Post Office, two new machines were installed (figs. 24, 25 and 26).

Transorma Sorting Machines have also been introduced at other post offices: at Haarlem there is a sorting installation consisting of a single machine which sorts both the incoming and outgoing mails; Utrecht has an installation comprising two such machines. while a further eleven Transorma Sorting Machines have been ordered by the Netherlands Postal Service, four of which are destined for sorting at The Hague (Railway Station), six for Amsterdam (Railway Station), and one for use at Breda.

The vast differences in the volume of postal traffic coped with by the various post offices called for considerable variety in construction. This has not been an easy problem for my collaborators to solve; but they have succeeded in satisfying the demands made. *Machines can now be supplied for any office, whether the volume of mail dealt with be small, medium, or large. The dimensions of the various types of Transormas are not rigidly fixed: as regards shape and size they can be adapted to meet the requirements of the rooms in which they are to be installed. In general it may be said that the necessary space need not exceed, and in many cases may even be less, than that required for the sorting equipment used for purposes of sorting by hand.*

The time has passed, when cautious officials took the precaution of having a complete hand-sorting installation in reserve, and where that was done, no use has ever been made of such reserves.

The smallest type of Transorma is operated by one man. The largest type, designed for offices coping with a million or more letters daily,

can be provided with an almost unlimited number of keyboards. Between these two types, an infinite variety of constructions can be worked out. The number of receptacles varies from 100 to an unlimited number.

It is a well-known phenomenon that after mechanizing one branch of manual labour, the need to mechanize auxiliary operations becomes more urgently felt. That was indeed what happened after "Transormas" had been installed at Rotterdam. Sorting was now effected far more quickly than before; but in comparison a great deal of time was still spent in bundling the contents of the receptacles, which caused considerable inconvenience, because after having been used for dispatch, the machines had to be ready to sort incoming mail without delay.

The want of a good machine for binding the bundles of correspondence was therefore acutely felt. Such contrivances were on the market, but were not found to be reliable in use, and failed to come up to expectation when tested.

We ascertained exactly what was required of a bundling machine. Existing types revealed the pitfalls to be avoided, and convinced us that we were already half-way on the road to success. After long experimenting, a bundling machine was constructed which fully met all the requirements of the Netherlands Postal Service. A demonstration was held as the result of which we received orders for the supply of some hundreds of bundling machines. The enormous success of this machine, the "Transorma B.S.M." (*B*undling-*S*ealing-*M*achine) as we called it, was immediately apparent, and its demand continues unabated, also for supply to various private enterprises (such as publishing firms and factories).

It is interesting to note how mechanical sorting has done away with practically all the drawbacks met with in the system of sorting by hand mentioned at the beginning of this chapter, and above all with the fatigue resulting from old methods. It is no longer necessary for the sorter to stand for hours on end; he can sit comfortably on a seat specially designed to afford the utmost comfort. Sitting for a long time also entails disadvantages, but these can be avoided by giving the Transormists in turn short-time standing jobs at the machine (e.g., replacing stocks, bundling the contents of the receptacles, etc.). Nor is there any longer a question of strain felt in the arms owing to having to hold a pile of letters in one hand, whilst the other has to do all the stretching. The left hand, with which the keys are pressed, operates on

the same plane; whilst the right drops the letters into the same slot, requiring only a very slight movement of the right arm, the elbow of which is, moreover, supported on a cushion.

Although the actual purpose of the Transorma is to mechanize the labour of sorting, I could go on enumerating many other advantages obtained from its use: only to mention the possibility of ascertaining who is responsible for a mistake in sorting, the reduced chances of mistakes being made or of letters being mislaid, as mail from two or more sorting-cases need no longer be combined and the economy in labour and elimination of walking to and fro which such combination entailed.

However, the two advantages of the Transorma which transcend all others are that:

1. The greater part of the mail is sorted according to destination in one operation;
2. The sorting is effected twice or three times as rapidly as when sorting by hand, and the machine can maintain that speed for an unlimited time.

I deem myself fortunate to have been able to devote all my energies to the study and solution of this problem with the help of those who co-operated with me, without whose substantial assistance the machine would never have materialised.

In this connection, I also wish to express my gratitude for the active support and encouragement given me by the Netherlands and Foreign Postal Services, which have likewise contributed to its success.

A NOITE — Domingo, 28 de abril de 1940

NUMEROS PARA INDICAR OS BAIRROS!

AS TRANSFORMAÇÕES DO SERVIÇO POSTAL— O PROPRIO PUBLICO APLICARA', FUTURAMENTE, O NOVO PROCESSO DESTINADO A FACILITAR A ENTREGA DA CORRESPONDENCIA — FUNCIONARIOS ESPECIALIZADOS ESTÃO SENDO PREPARADOS PELA ESCOLA TECNICA — APARELHOS MODERNISSIMOS DESTINADOS A REALIZAR A DISTRIBUIÇÃO DE TRINTA MIL CARTAS POR HORA

Inovando os nossos serviços postais

A manipulação mecanica da correspondencia e as suas grandes vantagens — Impressões de uma visita ao Correio Geral

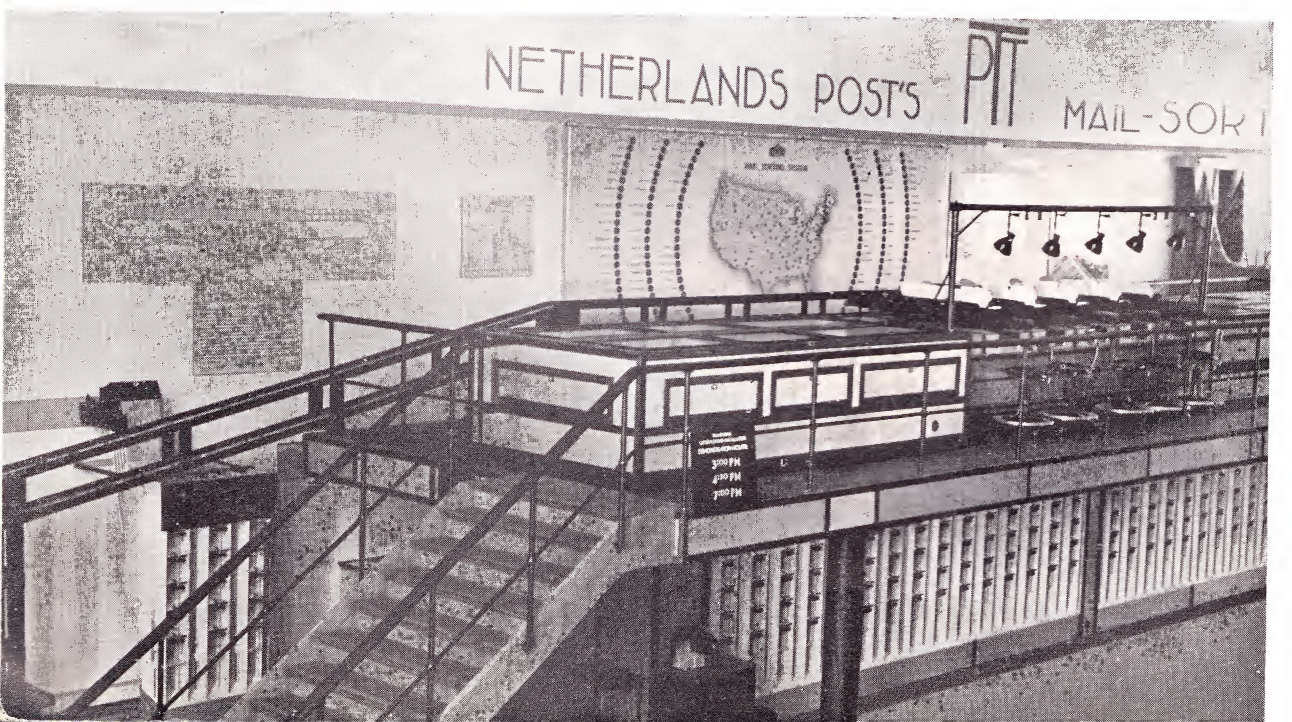
TRINTA MIL CARTAS em uma hora!

Os admiraveis resultados da mecanização dos serviços postaes

Technicos brasileiros para orientar o funccionalismo em todo o paiz

5. The public at Rio de Janeiro being informed of the inauguration of the Transorma Sorting Installation in that city.

4. The New York World's Fair 1939. Exhibits contributed by the Netherlands' Postal Service



CHAPTER III

GENERAL OUTLINE OF THE PROCESS OF MODERNIZATION

DISPATCH.

One of the main functions of the Postal Service is to convey mail from sender to addressee with the least possible delay, and various measures have been taken to that end, including the replacement of manual by mechanical labour, where such has been deemed necessary.

The task of the Post as conveyor commences as soon as an article is dropped into the letterbox, and delay can be avoided if each postal article is dealt with immediately after it has been posted. For that purpose mail should be transported as quickly as possible to the place where it is first dealt with. Sometimes the use of one or more belt-conveyors promotes rapid transport.

Such a belt might even form the bottom of the letterbox, so that each article dropped into the box falls on the conveyor and is immediately transported to where it is ready for its first treatment. Practical objections generally make this form of transport unsuitable for street letter-boxes; but for Post Office letter-boxes the use of a belt-conveyor is to be recommended, when distances have to be traversed and sufficient quantities of mail keep coming in all the time. Especially if more than one letter-box has to be cleared in the same office, it ensures prompt handling of the mail, and prevents a great deal of walking to and fro in the building.

Moreover, it is possible to arrange for articles for different destinations to be dropped into different slots by the public, from where belt-conveyors transport them to separate departments in the building. In this way the simple co-operation of the public provides for a rough preliminary sorting. It stands to reason that the above holds good only for traffic centres of some importance.

The clearance of street letter-boxes should take place in time to enable the mail to be dispatched by the principal means of transport available, or, in the case of local mail, to be included in a local delivery without delay.

Times of collection should be as late as possible, bearing in mind local conditions and the means of transport used to convey the mail

collected to the Office of Dispatch. So for instance, the congestion of traffic in a large city might make it unadvisable to use the fastest means of transport for this purpose, i.e. the automobile or motorcycle. In such cases it is necessary to have recourse to transport by bicycle, or, in the case of letter-boxes situated very close to Post Offices, clearances must be made by postmen on foot. In some places other measures have had to be taken to minimize the time required for transporting mail.

Instead of having collections effected from a central point, a certain office in each quarter of the town is charged with the clearance of the boxes in its vicinity. Letters are collected at that office and then transported to the Office of Dispatch.

This system may be the result of gradual development, or may have been introduced because, in view of traffic conditions, collection from a central point would entail greater delay.

When choosing between these two systems, the pros and cons should be weighed objectively — thus without reference to the method in use — so as to hit on the system guaranteeing the quickest conveyance of mail, provided it is economically workable. The fact that considerable quantities of mail are collected at the above-mentioned Post Offices for transport to the Office of Dispatch occasionally induced these Branch Offices to sort the mail. This would be explicable if due to lack of space at the Dispatch Office. By effecting a preliminary sorting of the mail at several offices — with or without stamp-cancelling — the number of letters that have to be subjected to a second sorting is reduced, and to some extent the space problem is thereby solved.

Such a method is, however, attended with great drawbacks. Rapid sorting with the most modern aids and appliances can best be effected at an office with a large volume of traffic. It goes without saying that in every case the method of sorting adopted should be as efficient as possible, i.e. adopted to the volume of traffic. It is this volume which mainly determines the choice of method and appliances required, and is the chief factor in considering the urgency for introducing mechanization; for the advantages offered by a method employing suitable mechanical equipment increase proportionally with the number of articles to be handled.

Generally speaking therefore, the most economical results are obtained when it is feasible to concentrate a large quantity of outgoing mail in one suitable spot, as has been irrefutably proved by statistics.

The decentralization of dispatch operations reduces the advantages obtained from mechanization, and therefore detracts from the attainment of speed.

Within certain limits, the centralization of the dispatch service is to be recommended in every case.

At the central Dispatch Office the mail collected from all the letter-boxes is deposited on a facing-table, either directly or by means of chutes installed above the tables.

The articles must then be faced, i.e. conveniently arranged for stamp-cancellation. This involves considerable loss of time, and in some countries attempts have been made to mechanize this process. However, a suitable apparatus, capable of reliably facing the postal articles faster than is possible by hand, has not so far been found. Let us hope that it will be invented some day; it would supply a very real want. Since no such apparatus is yet available, it is important not to leave it to each individual sorter to decide how this facing by hand should be done, but to introduce the most effective method. Attention should be paid, inter alia, to the form and dimensions of the facing-table. Low tables at which the staff can be seated to do their work are preferable to high ones at which they have to work standing.

During the facing process postal articles are also divided into those for which a stamp-cancelling machine can, or cannot, be used. Certain other divisions may also be effected. It is possible, for instance, to separate local mail and that for some of the very largest towns straight away. It should be remembered, however, that the facing is the main object in view, and that too many divisions of the mail are bound to retard it. Moreover, there is the further disadvantage that the articles sorted have to be kept apart during the process of stamp-cancelling, which makes for delay, and often tends to cause mistakes. Besides, the amount of space available generally makes any thorough splitting of the mail during the facing operation unpracticable.

From the facing-table the mail has to be transported to the stamp-cancelling machine or table where this is done by hand. Obviously, the machine or table should be placed as near as possible to the facing-table, otherwise a belt-conveyor can be used for this purpose. Below is a description of how such a system is frequently applied in practice: A belt-conveyor on which mail can be placed is installed over the

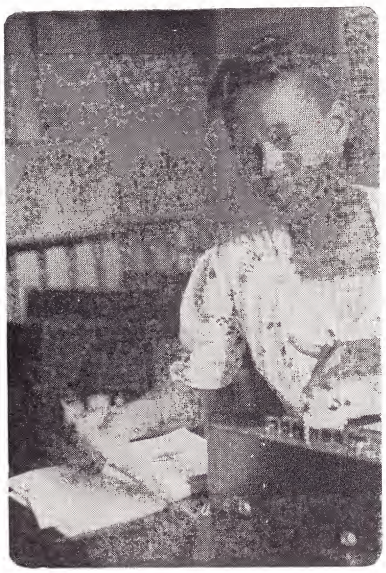
facing-table at a height conveniently within the sorters' reach. It can be set in motion by the operator of the stamp-cancelling machine whenever he requires a new batch of letters. After removing letters from it, he stops it. For the transport of larger objects, of which there are not so many, a non-stop belt-conveyor, which carries them up to the stamping table, is recommended. The belt-conveyors used for letter-boxes, referred to above, should also discharge their load in the immediate vicinity of the facing-table.

For stamping postal articles, which is done for the double purpose of cancelling the postage stamps affixed on them and indicating the time of their dispatch, handstamps and stamp-cancelling machines, as already mentioned, are used. Handstamps can roughly be divided into those with which the stamping is effected by means of pressure, and those with which an imprint is obtained by rolling the stamp over the article. The latter are very suitable for the stamping of large packets of irregular shape.

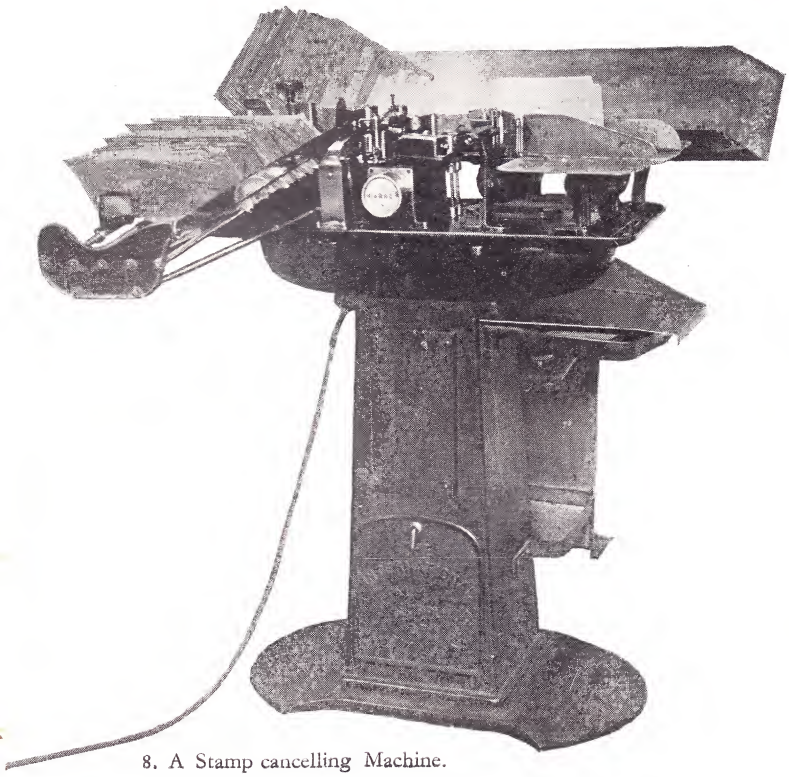
The number of articles that can be stamped by hand in an hour is rather small. It depends on the sort of stamp used, but in general it may be said to lie between three and four thousand. The capacity of stamp-cancelling machines is much greater; there are machines capable of stamping 60,000 articles an hour (figs. 7 and 8).

There are stamp-cancelling machines of various types and sizes on the market. Owing to their great capacity, these contribute considerably to the speeding up of the handling of mail at Post Offices. But there is yet another advantage attached to their use. Some stamping-machines are provided with a counting device, which renders it possible to ascertain the number of articles, for instance, for statistical purposes, or for determining how much staff is required to sort the mail. Such machines may likewise be used for franking letters, which in that case are handed in at the Post Office unstamped.

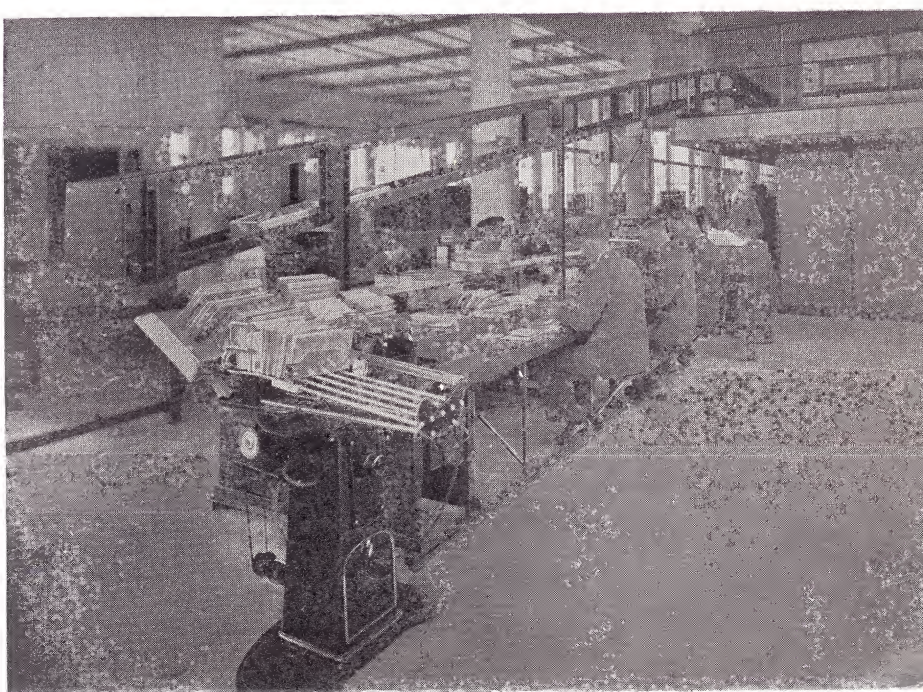
The imprint of the stamp then shows the amount of postage due or indicates that the postage has been paid. The counting apparatus of the machine registers the number of letters stamped, and thus fixes the total amount of postage due. This form of paying postage is very attractive to the public, because it does away with the affixing of postage stamps on each separate article, and the advantage to the Post Office is that such articles need not to be faced, because when this form of payment is used, it can insist on the public handing them in properly



6. A lady Transormist from Brazil.



8. A Stamp cancelling Machine.



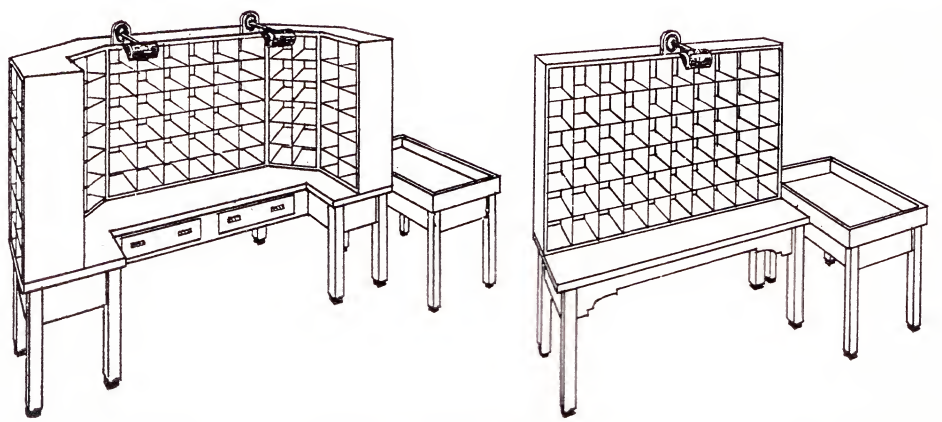
7. Mechanical stamp-cancelling of postal articles automatically transported to the Transorma Sorting Installation.

arranged. Nor is it necessary to face mail franked by senders by means of their own franking-machines, or that for which autorization has been given to pay the postage in bulk (e.g., per thousand) or by subscription.

After stamps have been cancelled, the mail has to be transported to the place where it is sorted. This takes time, and the greater the distance to be covered, the greater the loss of time. Thus the shorter the distance between the stamp-cancelling and sorting departments, the less time will be lost. The arrangement of the Dispatch Office might make it difficult for these departments to be adjacent. In that case too, the use of belt-conveyors for transport of the stamped mail will effect a maximum saving of time and cost.

For transport to a higher or lower floor use may also be made of a lift, if necessary combined with belt-conveyors. The mail thus transported should be brought as near the sorter as possible; in any case it should be unnecessary for him to leave his place in order to obtain a new stock. He should be able to devote his full attention to the sorting, as any diversion affects his output unfavourably. A good method of ensuring that the mail to be sorted is within easy reach of the sorter is to place the postal articles in question on a table with upright edges like a tray, which can be placed alongside that at which he is seated.

In most countries the mail is sorted at sorting-cases or sorting tables. The latter offer the advantage of enabling the work to be done sitting and comparatively fast; but the number of sections into which the mail can be split is limited (fig. 9).



9. Two types of Hand-sorting cases.

For purposes of more detailed sorting, a certain number of pigeon-holes are required, the exact number being determined by various factors. The ideal sorting-case is, of course, one containing pigeon-holes equal in number to the amount of sections into which the mail must finally be split; but in the case of hand-sorting this is not practicable when there is a considerable volume of mail to be dealt with. Matters are different in the case of mechanised sorting: the number of sections into which the mail can then be split in a single operation is practically unlimited. This point will be reverted to later on.

In the case of sorting by hand the maximum number of sections into which the mail can be sorted may be estimated at sixty. To increase that number imposes too great a sacrifice of speed, which incidentally is an important factor to be considered in allocating the personnel required for dispatch departments.

When discussing the various methods of sorting and their respective speeds, the expression "standard rate" is used; a term that has often led to misunderstanding, if only because it is used in more than one sense.

In the following pages it does not denote an "ideal rate", i.e. the rate showing how many postal articles of more or less uniform size can be sorted by a fast sorter, working under the most favourable conditions during a comparatively short-time test. The term "standard rate" is here used to signify the average number of articles of all kinds, which a sorter, working with proper equipment under what can be regarded as normal conditions, is capable of sorting in a given unit of time; such rate being the practical basis on which allocations of personnel are made to the department in question. In fixing the standard rate, allowance has been made for differences in the shape and size of postal matter, differences due to variations in the number of sections into which the mail has to be sorted, as well as the varying capacities of quick, average and slow sorters.

The following are the standard rates of sorting based on practical experience:

a. 1600 articles per hour in the case of preliminary sorting into cases containing a maximum of 60 sections;
b. 1200 articles per hour in the case of final sorting into cases containing a maximum of 60 sections.

Statistics from several large Post Offices disclose a reduction of between 15 % to 40 % on these rates. The rates of 1600 and 1200 respectively for sorting by hand are therefore on the high side, so that when comparing the results of mechanical sorting we cannot be accused of bias.

Until the Transorma Sorting Machine made its appearance, only sorting-cases and sorting-tables were used in all Dispatch Offices.

The drawbacks of this equipment were very apparent and various attempts were made to abolish them without, however, abandoning the idea of sorting by hand. Here and there improvements were devised by installing belt-conveyors to collect the contents of pigeon-holes labelled to contain mail adressed to the same destination, and by endeavouring to enable sorters to be seated whilst at work. Laudable though these and other attempts were, all they did was to mitigate without eliminating disadvantages inherent in the system.

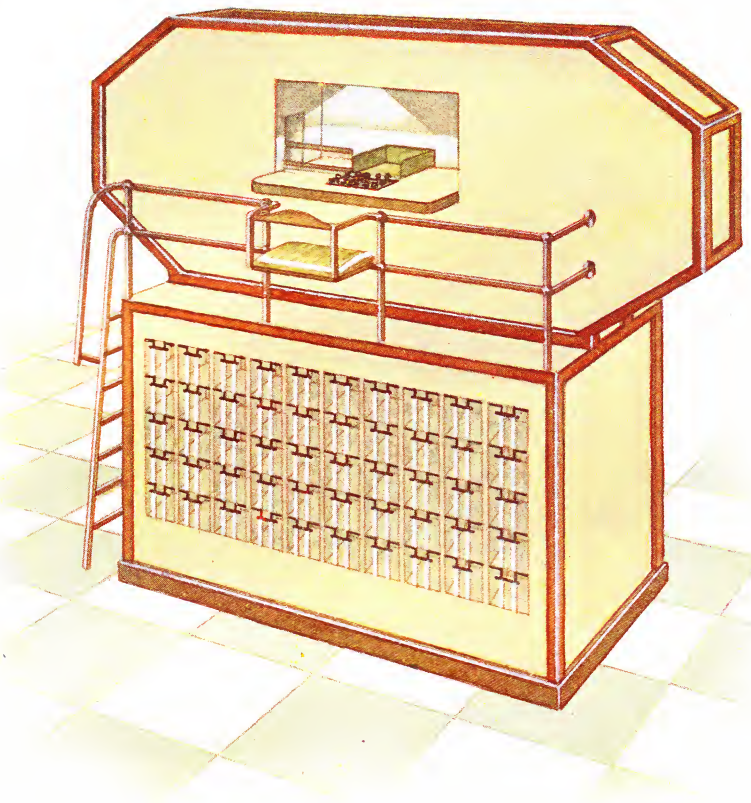
Only by adopting the entirely new principle of mechanical sorting by a Transorma Sorting Installation have the inconveniences of the old system been abolished. Moreover, several additional advantages are thereby obtained.

Mechanical sorting meets the needs of all offices dealing with fairly large quantities of mail. In order to determine which type of sorting installation is best suited for a particular office, and to estimate the possible advantages thereby obtained, offices may be classified in four categories, namely:

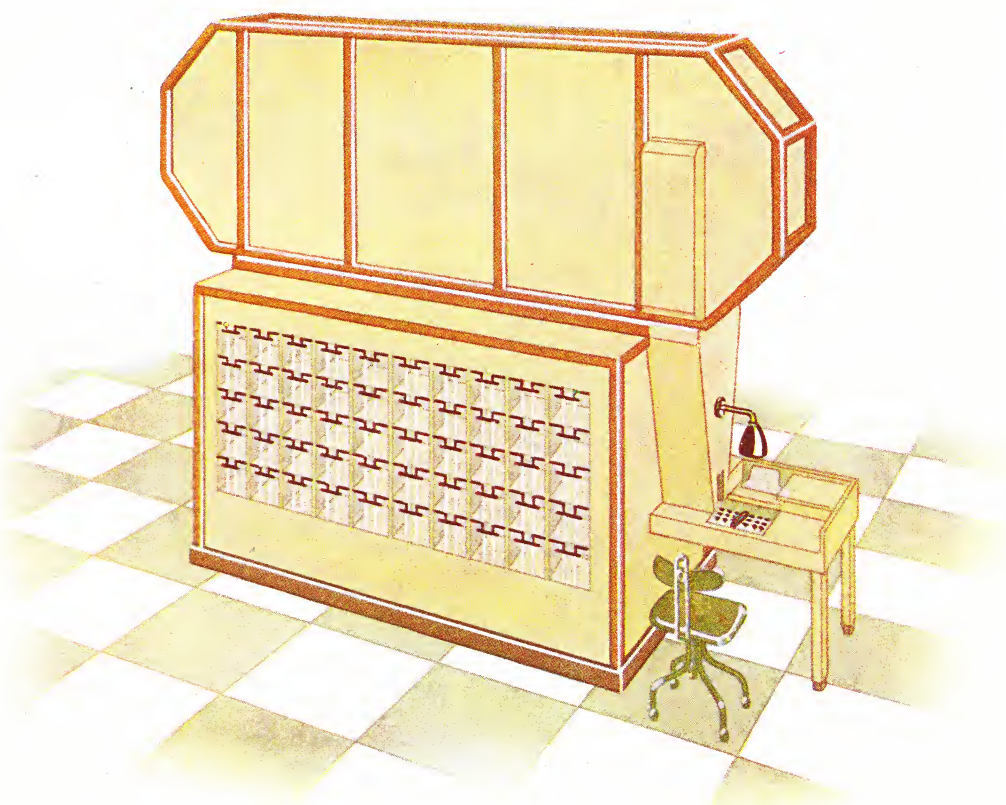
A. Those sorting approximately 25,000 articles per day.
B. Those sorting approximately 25,000—150,000 articles per day.
C. Those sorting approximately 150,000—500,000 articles per day.
D. Those sorting more than 500,000 articles per day.

The tables attached hereto compare the number of hours needed to sort mail by hand and by use of a Transorma Sorting Installation operating eight hours per day. Naturally, the longer the machine is used, the greater is the ratio of time saved. When necessary, whilst not being used for purposes of dispatch, the installation can be employed to sort incoming mail for delivery, in which connection the reader is referred to the heading "Delivery" found at the end of this chapter.

In Tables B, C and D (Dispatch), 5 %, 10 % and 5 % respectively of the mail, after having been sorted mechanically, is sorted further by



10. Various adaptations of the Transorma Sorting Machine Type A 1/100.



hand. In many cases even this hand sorting could be mechanized, thus considerably economizing expenditure on wages. The small model Transorma Sorting Machine (figs. 10, 14 and 15) described in Chap. VI is suitable for this type of work.

Even when the Transorma is used for fewer hours a day mechanical sorting still remains worth while. Shorter daily hours of operation lengthen the durability of the machines proportionately. The possibility of only being able to use a Transorma for a comparatively short period each day should not in itself justify reluctance to purchase it, anymore than such considerations affect the purchase of plant installed in newspaper printing-offices and bakeries. Whether mechanical sorting would be advantageous or not must be considered solely on the basis of exact calculation.

To determine the possible saving of time in handling mail in a given case, the necessary calculations must be made, after ascertaining which type of sorting-machine is best suited for the object in view. The net amount of money saved is obtained by deducting the annual amounts written off for depreciation of the Transorma Sorting Installation from the amount calculated to have been saved on the wages of personnel in a statement prepared for that purpose. In view of the variety of Transorma models available, each case should be submitted to the manufacturers for advice.

Apart from the saving in time and money, application of the Transorma mechanical sorting method offers the following advantages, which cannot be assessed directly in terms of cash:

a) The high rate of sorting 3000 articles per man per hour. As already stated in the case of sorting by hand the speed which can be reached is 1600 articles per hour for preliminary sorting and 1200 for final sorting.

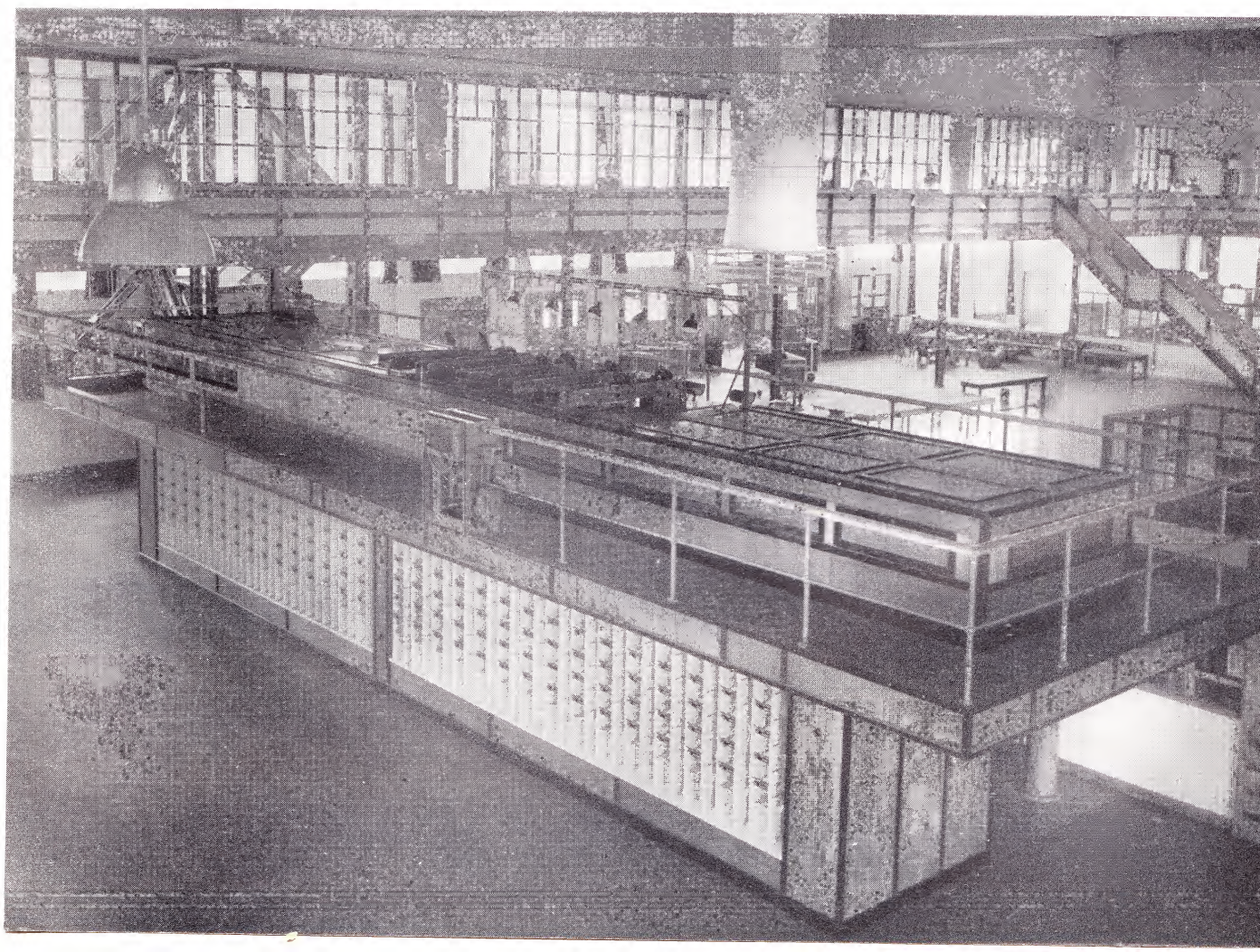
b) In the case of mechanical sorting, mail can be sorted for some hundreds of destinations in one single operation by less experienced personnel.

c) Owing to the fact that the machines automatically collect in one receptacle all articles for the same destination though dealt with at different keyboards, further collection becomes unnecessary. This greatly simplifies transport, and precludes errors in dispatch as the result of inadvertently combining batches of letters for different destinations.

12. Transormists at work.

13. The comfortable seats provided for Transormists.

11. The Transorma Sorting Installation (Type A 5/300) at the Dispatch Office, Central Railway Station, Rotterdam.



d) The postal-matter to be sorted is conveniently placed within the transormist's reach. Each letter is automatically carried to the same spot in front of him, a slight movement of the hand being all that is required to deal with each article (figs. 12 and 13).

e) The number of articles sorted is registered by a counting apparatus, thus affording an additional means of checking the output of each operator.

f) Each article sorted is so marked that it is easy to trace by whom a sorting error has been made.

g) A reduction in the number of appliances used, tending to simplify the task of supervision.

h) The number of supervisors can be reduced because the output of each sorter is automatically registered and fewer sorters are required.

i) In the case of the Transorma Sorting Installation, the letters are dropped into a slot from which the receptacles are at some distance. Consequently, the emptying of the receptacles in no way disturbs the staff operating the machines.

j) The machine sorts the articles into receptacles, automatically stacking them in regular piles. In the case of sorting by hand this stacking depends on the individual sorter's sense of neatness.

k) In the case of a sorting-machine, the keyboard represents the area of operation. This can easily be lighted artificially. To obtain a similar effect in using a sorting case, each pigeon-hole would have to be artificially lighted.

Mechanical sorting is the only means of obtaining the quickest and most economical dispatch.

DISPATCH

A. Offices with a traffic of up to 25,000 articles per working day. [1])

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	24,000	40 large towns and 2 heaps over	60%	1600	9600	15
second	9,600	100 small towns and directions	40%	1200	—	8
					Total per working day....	23 hours
Mechanical sorting						
one only	24,000	140 large and small towns and directions	100%	3000	—	8 per 1 *Transorma* Sorting Machine with one keyboard and 140 receptacles (type A 1/140)
					Total per working day....	8 hours

With mechanical sorting a gain of 15 hours per working day.

Advantages of mechanical sorting by means of a Transorma Sorting Installation:

Speeding up of the handling of the traffic;
a 65 % saving of staff expenses.

[1]) It has been assumed that when stacking the mail the local correspondence has been kept apart.

B. Offices with a traffic of 25,000 to 150,000 articles per working day. [1])

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	120,000	40 large towns and 5 heaps over	50%	1600	60,000	75
second	60,000	300 small towns and directions	50%	1200	—	50
					Total per working day....	125 hours
Mechanical sorting						
first	120,000	299 large towns and 1 heap over	95%	3000	6,000	40 per 1 *Transorma* Sorting Machine with 5 keyboards and 300 receptacles (type A 5/300)
second (by hand)	6,000	41 small towns and directions	5%	1200	—	5
					Total per working day....	45 hours

With mechanical sorting a gain of 80 hours per working day.

Advantages of mechanical sorting by means of a Transorma Sorting Installation:

Speeding up of the handling of the traffic;
a 64 % saving of staff expenses;
collection of mail from corresponding pigeon-holes is superfluous.

[1]) It has been assumed that when stacking the mail the local correspondence has been kept apart.

C. Offices with a traffic of 150,000 to 500,000 articles per working day. [1])

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	480,000	25 large towns and 15 directions	30%	1600	336,000	300
second	336,000	550 large towns and 10 directions	50%	1600	96,000	210
third	96,000	550 small towns and directions	20%	1200	—	80
					Total per working day....	590 hours
Mechanical sorting						
first	480,000	280 large towns and 20 directions	90%	3000	48,000	160 per 4 *Transorma* Sorting Machines each with 5 keyboards and 300 receptacles (type A 5/300)
second (by hand)	48,000	845 large towns and directions	10%	1200	—	40
					Total per working day....	200 hours

With mechanical sorting a gain of 390 hours per working day.

Advantages of mechanical sorting by means of a Transorma Sorting Installation:

Speeding up of the handling of the traffic;
a 66% saving of staff expenses;
less putting together of mail from corresponding pigeon-holes.

[1]) It has been assumed that when stacking the mail the local correspondence has been kept apart.

DISPATCH

D. Offices with a traffic of over 500,000 articles per working day. [1])

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	2,160,000	40 parts (states, directions or alphabetically)	0%	1600	2,160,000	1350
second	2,160,000	40 x 38 = 1520 large towns; 40 x 2 heaps over	80%	1600	432,000	1350
third	432,000	80 x 40 = 3200 small towns and directions	20%	1200	—	360
					Total per working day....	3060 hours
Mechanical sorting.						
first	2,160,000	292 large towns and 8 heaps over	60%	3000	864,000	720 per 3 *Transorma* Sorting Machines each with 30 keyboards and 300 receptacles (type A 30/300)
second	864,000	8 x 499 = 3992 large towns and directions	35%	3000	108,000	288 per 8 *Transorma* Sorting Machines each with 5 keyboards and 500 receptacles (type A 5/500)
third (by hand)	108,000	8 x 55 = 440 towns and directions	5%	1200	—	90
					Total per working day....	1098 hours

With mechanical sorting a gain of 1962 hours per working day.

Advantages of mechanical sorting by means of a Transorma Sorting Installation:

Speeding up of the handling of the traffic;
a 64 % saving of staff expenses;
less putting together of mail from corresponding pigeon-holes.

[1]) It has been assumed that when stacking the mail the local correspondence has been kept apart.

TRANSPORT.

At a certain moment the sorted mail found in the receptacles of sorting installations has to be bundled, either because the receptacle in question is full, or because it is time for such mail to be dispatched to its destination. The less time required for tying up correspondence, the more mail can be got ready for dispatch at the appointed time.

There are offices where bundling is quickly disposed of, owing to the fact that large numbers of the staff are simultaneously employed on the job, but then arises the difficulty that it is seldom possible to find productive work for such workers during the intervals between successive periods of bundling mail. A better solution, therefore, is to have the bundling done by machine. The Transorma Bundling and Sealing Machine "B.S.M." is best suited for this purpose. It ties up bundles of any size far more securely than is possible by hand. Instead of crossing the string as is done when bundling by hand, a single string tied breadthwise is sufficient, thus effecting an enormous saving in the use of string. The secure fastening of the string, namely with a metal band, instead of by a knot (as is the case when bundling by hand), permits the use of strings made of sisal or even paper, which cost considerably less than the kinds of string formerly used by the Post. The amount saved on the cost of string by use of a Transorma Bundling and Sealing Machine "B.S.M." is so great that it covers the annual amounts written off for depreciation of the machine (fig. 18).

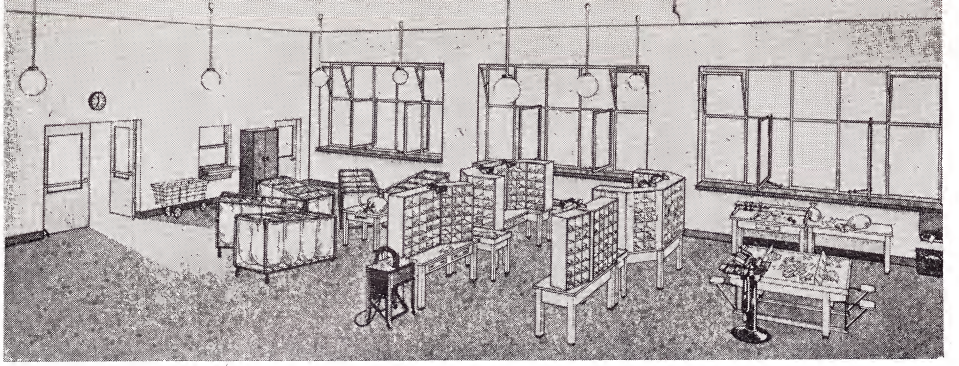
Moreover, expenditure on wages is also reduced, and lastly transport of the mail is accelerated. The machine can bundle 1500 packets per hour.

After the mail has been tied up, the bundles must be taken to the place where the bags are closed. For this purpose, apart from the belt-conveyors already mentioned, chutes may also prove handy. Office trucks and baskets on under-carriages may be used for short-distance transport of small quantities of mail. If required the bundles may be transported by separate belt-conveyors to the department where the mail bags are closed.

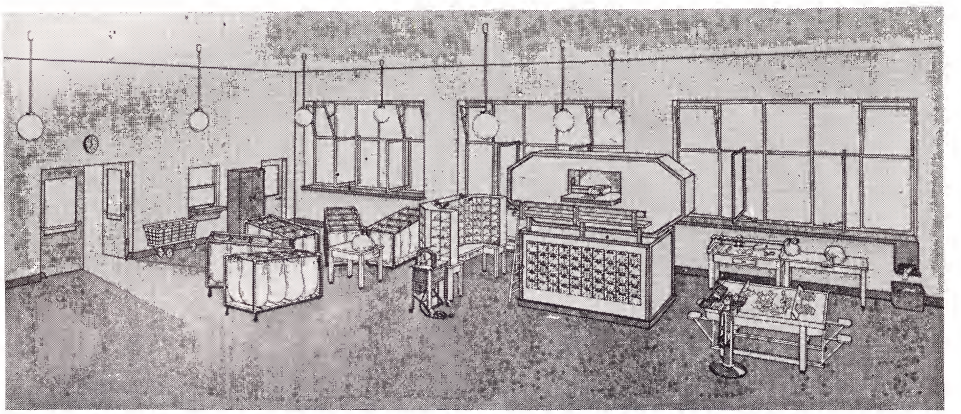
At practically all offices the sealing of mail bags is still done by hand, sometimes with sealing-wax or metal seals, the latter being the simpler and more effective method, preferable also because it takes less time. Mechanical sealing would also be possible. The bags must be removed to somewhere outside the office, which could be done, for

19. Mechanical sorting by a Transorma in an Airport Dispatch Office.

20. An Autogyro over a Post Office with roof equipped as landing place.

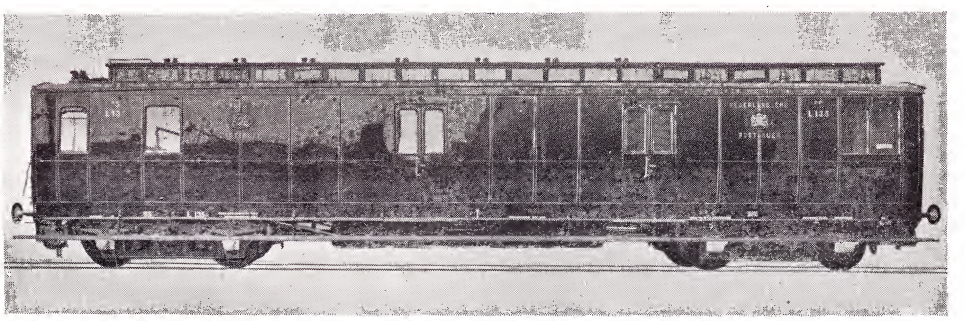


14. Interior of the Dispatch Department of a Post Office where sorting is done by hand.

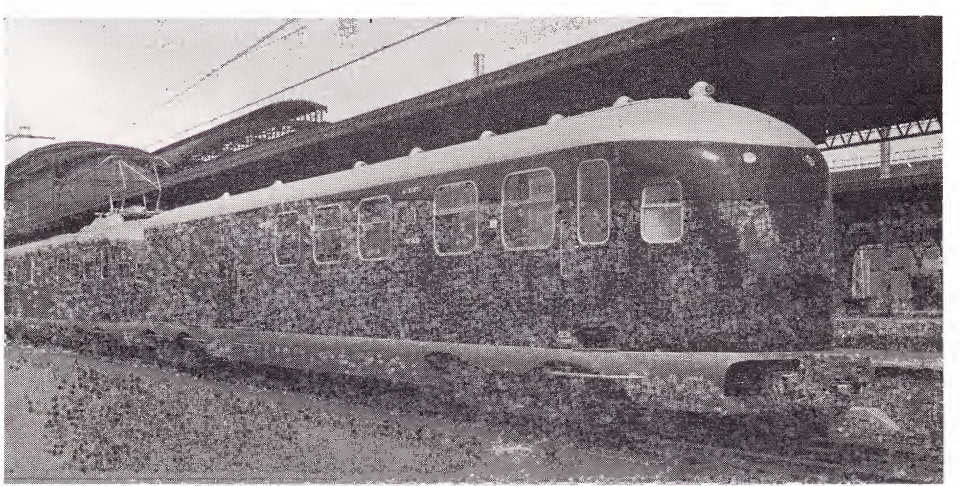


15. Interior of the same Department after the installation of a Transorma Sorting Machine A 1/100.

16. Eight-wheeled Mail Van for steam traction.



17. Eight-wheeled Mail Van for electric traction.



instance, by means of a belt-conveyor, whereon they could be sealed. This would eliminate any holding up of the mail bags for this purpose.

In most countries mail is principally transported by rail (figs. 16 and 17). If the forwarding office is attached to a railway station, a great saving of time is obtained, and part of the mail can then be dispatched at an earlier opportunity than would otherwise be the case.

Meanwhile, it is obvious that transport by air especially over long distances, is gradually becoming the most suitable means of carrying mail. The airmail letter is fast becoming the normal letter. Additional charges for airmail are being gradually reduced and will at some time or other disappear altogether. It goes without saying that this will lead to a considerable increase in airmail traffic.

The Transorma Sorting Installation offers a solution to the problem of handling airmail, which must be sorted quickly for a large number of destinations at Forwarding Offices attached to airports (fig. 19).

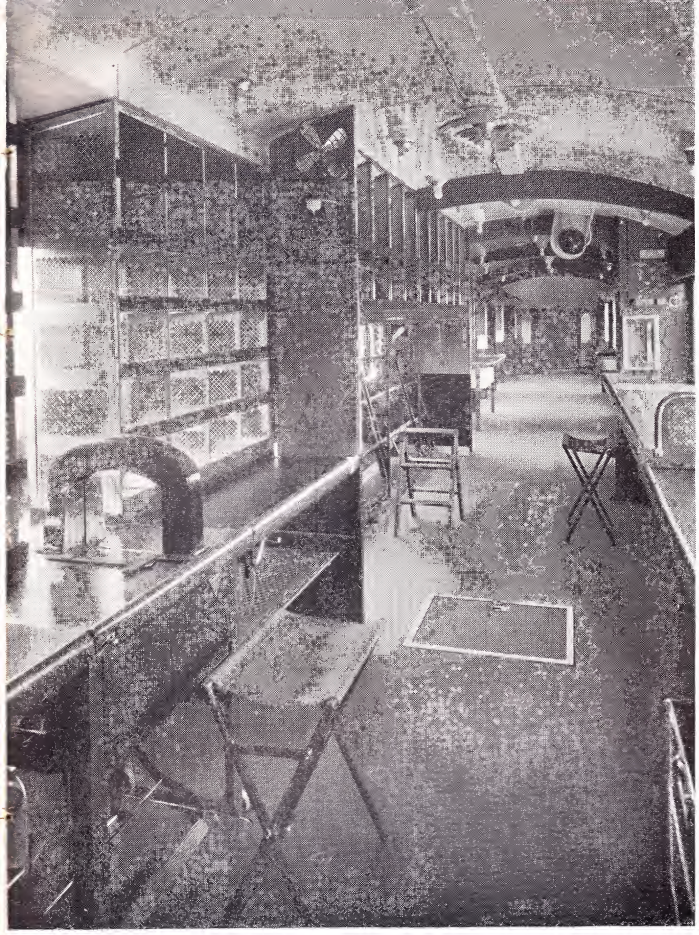
Airfields are generally situated at some distance from towns. The transport of mail from the airfield to the local Post Office from which it is delivered, is frequently a source of considerable delay. Obviously such delay can be considerably reduced by means of well-planned motor services. But this means of transport is already threatening to become oldfashioned and a new solution is in sight. In the U.S.A. there are already Forwarding Offices with flat roofs, used as landing- and taking-off grounds for autogyro planes, which act as a link between the Post Office in the town and the airfield situated at some distance from it (fig. 20).

To keep the roofs ice- and snowfree, they must be heated.

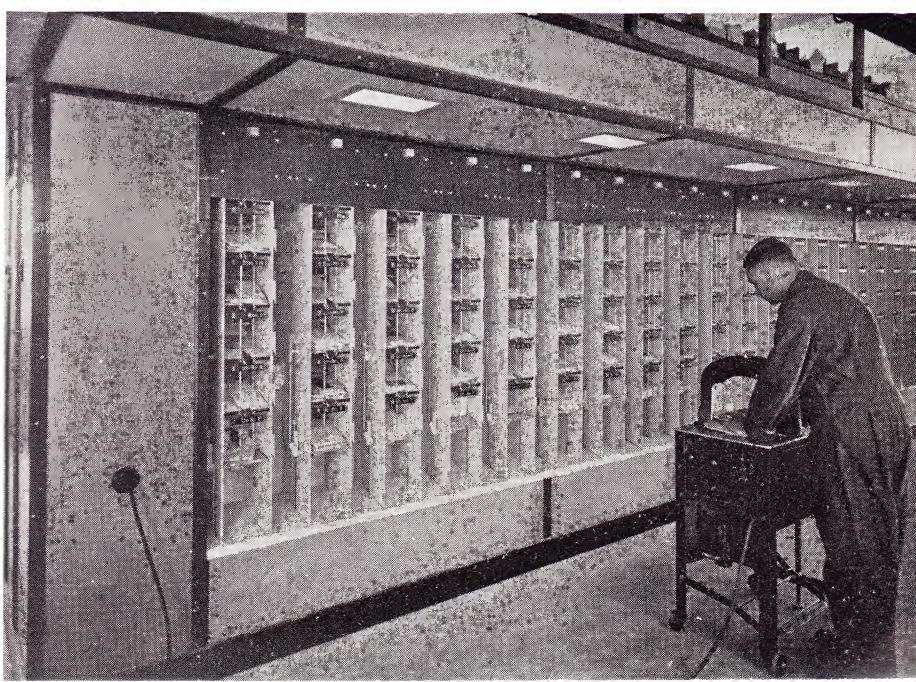
Meanwhile, it looks as though maintenance costs will for some time to come continue to be too high to compensate for the saving on other expenditure. It may certainly be expected, however, that the factor of time saved will be startling enough to induce the necessary financial sacrifice.

The establishment of dispatch offices in the immediate neighbourhood of the principal means of transport greatly contributes to the early arrival of mail at its destination.

The short distance transport of the sealed mail bags to the trains can then be effected by moving-stairs, motor lorries, platform trucks, or other vehicles specially built for the purpose. Wherever possible use of the platforms of busy stations should be avoided. In such cases,



21. Interior of a modern Mail Van (in the foreground a Transorma Bundling and Sealing Machine "B.S.M.").



18. Mechanical bundling of the contents of the receptacles of a Transorma Sorting Machine.

delay can be overcome by using suspension-bridges, lifts and tunnels, which should not be accessible to the public.

For longer distances between the Post Office and the railway station, automobile transport is obviously the fastest. Under certain conditions, underground communications might be used. It ought not to be necessary to point out that mail should as far as possible be sorted at the Forwarding Offices. It is easier to organize the work of personnel in a building than in a running train, because the actual working-hours of train staff in relation to their hours of service — including the time spent at termini outside where they are stationed — are comparatively short.

Moreover, the limited space available in a train usually forms an obstacle to the employment of large numbers of personnel. To this must be added the fact that both the initial and running expenses of mail vans are high.

The ideal plan would be for all mail to be sorted at Dispatch Offices, trains being merely used to transport sealed batches thereof. This, however, does not appear to be altogether practicable. In some countries at any rate, in order to avoid delay, the sorting of mail bundled elsewhere cannot be avoided. In certain trains (night-trains, for instance) it will probably be necessary to sort ordinary mail alongside the registered mail. And since it would be difficult to install sorting-machines in mail vans, it will be impossible for the time being to do without ordinary sorting cases and tables. It is possible, however, to install bundling machines in mail trains (fig. 21), where, in view of the short time generally available for tying up the mail, they will prove to be of even greater service than in Dispatch Offices.

On board mail steamers, room can be found for any office machine, but still less than on trains it is advisable to have mail dealt with on board. For that matter, the number of "Sea" Post Offices — very costly in proportion to the purpose served — is very small. Since the appearance of the aeroplane, mail steamers have, moreover, lost much of their value for the postal service. As far as postal transport is concerned, they will probably be restricted to the transport of non-urgent postal articles, such as large quantities of printed matter, and the like.

DELIVERY.

As explained in the foregoing under "*Dispatch*", the establishment of Dispatch Offices in the immediate vicinity of the principal means of

transport results in a considerable saving of time in the handling of mail. If local conditions, (for instance, a too inconvenient situation of the railway station or airfield) do not stand in the way, it is advisable to establish the main Delivery Office there too, thus generally adjoining or in the neighbourhood of the railway station. All the technical equipment found on the platforms, such as overheadbridges, lifts and tunnels, as well as the motor lorries, platform-trucks and other contrivances for transport can also be used to convey incoming mail to the Delivery Office. Inside the building, the rapid transport of mail can again be effected by means of belt-conveyors, chutes and lifts.

The process described under "*Dispatch*" is now reversed. The bags of mail are transported to the building, where they must first be opened. For this purpose the bags have to be lifted to a certain height, and obviously if the number of bags is considerable, the staff employed on this job are liable to fatigue. To prevent this, a hoisting apparatus may be used. A hook is fastened to the bottom of the bag, and the bag is then hoisted mechanically to a certain height. The seal is now broken, so that the contents, accompanied by a good deal of dust which has penetrated between the postal articles and is found in the bags themselves, fall on to the table placed underneath. In order to get rid of this dust, the table may be provided with a perforated top with a dust drawer underneath. The dust then falls through the perforations into the dust drawer, from which it is emptied at regular intervals. The dust problem can be solved still more effectively by providing the table with a suction fan.

The bundles dropped on the tables are unfastened, for which purpose knives can be used, enabling the operation to be done quickly without damaging the contents of the bundles.

The knives used are provided with a ring which is slipped on to one finger, or are knives with a bent point, the blade of which is protected by a round bar bent at the point. To be able to cut with these, the knife must first be slipped under the string. In some countries it is customary for the bundles to be sealed by means of a string, the ends of which are wound round a metal or fibre roll. These strings can be used repeatedly and must, therefore, be collected each time. This causes delay, in addition to which both the tying-up and loosening of the bundles exact too much time, precisely at moments when rapid handling is urgently required.

In some countries it is also customary to mark the date of arrival

on mail received for delivery. Just as in the case of stamp-cancelling before dispatch, a stamping machine is an excellent means of minimizing the time required for this operation. When a Transorma Sorting Machine is used, no extra time is needed for this purpose, because such machines can stamp the mail automatically during the process of sorting. Reference will be made to this point in discussing sorting operations.

The mail received is divided into articles of normal size and packets which, owing to their dimensions, require separate handling and the use of special sorting equipment. Both kinds of mail must be transported to the sorting department, and here too, office trolleys, lifts, chutes, belt-conveyors and baskets on under-carriages will prove useful. For distances and considerable quantities of mail, belt-conveyors are to be preferred, because they are quick and reliable, and no obstruction is caused by getting in the way of trolleys, etc.

The number of sections into which the mail received must be divided depends on the number of P.O. boxes and the number of postmen required to deliver the mail. The latter varies for each delivery, which fact might lead to the preliminary sorting of the mail being adapted accordingly, necessitating sorting into a varying number of sections at different hours of the day. As a rule this method is not followed, and rightly so. It is better to have the mail sorted into the same number of sections at all hours of the day, effecting the necessary increase or reduction of delivery staff by splitting or combining the separate sections into which the mail has been sorted. The staff charged with the preliminary sorting of mail thereby acquires an effective routine, which makes for faster work.

For the same reason, it is advisable that a postman's round should as far as possible consist of undivided streets. If this is impracticable, and a street, because of its length or for some other reason, must be included in more than one round, the most convenient division should be made, that is to say it should be split as little as possible, and then at points that are easily memorized, marked for instance by a square, bridge, canal, or the like.

At smaller Post Offices it is straight away possible to split the incoming mail into the number of sections required: at larger offices this is not feasible in the case of sorting by hand; several rounds of sorting are then necessary.

The Transorma Sorting Machine entirely dispenses with the

necessity of preliminary sorting and sorts the incoming mail in a single operation according to the number of rounds into which deliveries must be divided and the number of P.O. boxes.

Mechanical sorting involves many additional advantages. For purposes of comparison, the following tables have been compiled, showing how many working hours are required for sorting a certain number of postal articles by hand, and in how many hours the same work can be completed by a Transorma Sorting Installation. The figures quoted are based on practical experience. Just as was done in describing sorting operations for purposes of dispatch, Post Offices are divided into four categories according to the volume of mail dealt with:

A. Offices with an incoming mail of approximately 25,000 articles per working day.

B. Offices with an incoming mail of approximately 25,000—150,000 articles per working day.

C. Offices with an incoming mail of approximately 150,000—500,000 articles per working day.

D. Offices with an incoming mail exceeding 500,000 articles per working day.

DELIVERY

A. Offices with a traffic up to about 25,000 articles per working day.

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	24,000	20 districts of 4 rounds 24 lessees of P. O. boxes 1 group of lessees of P. O. boxes	10%	1600	21,600	15
second	21,600	80 rounds 36 lessees of P.O. boxes	90%	1600	—	13½
					Total per working day....	28½ hours
Mechanical sorting.						
one only	24,000	80 rounds 60 lessees of P.O. boxes	100%	3000	—	8 per 1 *Transorma* Sorting Machine with one keyboard and 140 receptacles (type A 1/140)
					Total per working day....	8 hours

With mechanical sorting a gain of 20½ hours per working day.

Advantages of mechanical sorting with a Transorma Sorting Installation:
Speeding up of the handling of the traffic;
a 71 % saving of staff expenses.

NOTE TO SCHEME A.

The town is divided into 80 delivery rounds, while 60 P.O. box lessees fetch their mail from the Post Office. It is therefore impossible to sort the mail by hand in a single operation. According to the method described above, which is usually adopted in practice, the mail would be split into 20 sections, each containing 4 delivery rounds, and 25 sections for P.O. box lessees, 24 of which are for the 24 most important P.O. box lessees, one section being reserved for the remaining lessees.

Only the 24 sections for the 24 principal lessees are sorted according to destination; for the rest of the mail a second sorting is necessary.

In the case of mechanical sorting, all the mail is sorted according to destination in one operation.

Calculations prove that mechanical sorting by means of a Transorma Sorting Installation results in:

A speeding up of the handling of mail;

a saving of 71 % on the wages of personnel.

DELIVERY

B. Offices with a traffic of 25,000 to 150,000 articles per working day.

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	120,000	6 districts of 25 rounds each 3 groups of lessees of P.O. boxes. 31 lessees of P.O. boxes	5 %	1600	114,000	75
second	114,000	150 rounds 119 lessees of P.O. boxes	95 %	1600	—	72
					Total per working day....	147 hours
Mechanical sorting						
one only	120,000	150 rounds and 150 lessees of P.O. boxes	100 %	3000	—	40 per 1 *Transorma* Sorting Machine with 5 keyboards and 300 receptacles (type A 5/300)
					Total per working day....	40 hours

With mechanical sorting a gain of 107 hours per working day.

Advantages of mechanical sorting with a Transorma Sorting Installation:
Speeding up of the handling of the traffic;
a 72 % saving of staff expenses.

NOTE TO SCHEME B.

The town is divided into 150 delivery rounds, while 150 lessees of P.O. boxes fetch their mail from the Post Office. When sorting is done by hand, sorting in one round is impossible.

In the first sorting there are six sections, each containing 25 delivery rounds, 3 sections each containing the mail for 40 lessees of P.O. boxes, and 31 sections for the most important lessees.

95 % of the mail requires a second sorting. When mechanical sorting is applied, all the mail is sorted according to destination in one operation. Calculations show that the following advantages are then obtained:

A speeding up of the handling of mail;
a saving of 72 % on the wages of personnel;
less necessity of collecting correspondence sorted into receptacles labelled for the same destination.

C. Offices with a traffic of 150,000—500,000 articles per working day.

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
Hand sorting						
first	480,000	20 districts of 15 rounds each 20 groups of lessees of P.O. boxes	0%	1600	480,000	300
second	480,000	300 rounds 300 lessees of P. O. boxes	100%	1600	—	300
					Total per working day....	600 hours
Mechanical sorting						
first	480,000	300 rounds 80 lessees of P.O. boxes 20 groups of lessees of P.O. boxes	90%	3000	48,000	160 per 4 *Transorma* Sorting Machines each with 5 keyboards and 400 receptacles (type A 5/400)
second (by hand)	48,000	220 lessees of P.O. boxes	10%	1600	—	30
					Total per working day....	190 hours

With mechanical sorting a gain of 410 hours per working day.

Advantages of mechanical sorting with a Transorma Sorting Installation:
Speeding up of the handling of the traffic;
a 68 % saving of staff expenses.

NOTE TO SCHEME C.

The town is divided into 300 delivery rounds, while 300 P.O. box lessees fetch their mail from the Post Office.

When the sorting is done by hand, not a single article is sorted according to destination in the first operation. The mail is sorted into 20 districts, each containing 15 delivery rounds, and 20 sections for P.O. box lessees, for example, alphabetically according to their names or the numbers of their P.O. boxes. Afterwards the mail for the P.O. box lessees is deposited in their boxes; that for delivery is sorted for the various rounds.

When mechanical sorting is resorted to, 90 % of the mail is sorted according to destination in the first round of sorting, and only part of it, i.e. half the total amount adressed to P.O. box lessees must undergo a second sorting.

It is possible to sort all the mail according to destination in one operation by using Transorma Sorting Machines with 600 receptacles. Each particular case must be investigated to ascertain whether the number of letters justifies the addition of the 200 receptacles. Calculations show that the following advantages are obtained:

A speeding up of the handling of mail;
a saving of 68 % on the wages of personnel;
less necessity of collecting correspondence sorted into receptacles labelled for the same destination.

D. Offices with a traffic of over 500,000 articles per working day.

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
		Hand sorting.				
first	2,160,000	*At the Head Office*: 10 districts of 20 rounds of the Head Office;	0%	1600		
		20 groups of lessees of P.O. boxes of the Head Office;	0%			
		5 delivery districts (of the 5 District Offices);	0%			
		5 groups of P.O. box lessees of the 5 District Offices	0%		2,160,000	1350
second	1/6 x 2,160,000	*At the Head Office*: 200 rounds of the Head Office; 200 lessees of P.O. boxes of the Head Office	16⅔%	1600	—	225
	5/6 x 2,160,000	*At the 5 District Offices*: 5 x 20 districts of 10 rounds	0%	1600		
		5 x 5 groups of P.O. box lessees	0%			
		5 x 35 P.O. box lessees	8⅓%		1,620,000	1125
third	1,620,000	*At the 5 District Offices*: 5 x 200 rounds	66⅔%	1600	—	
		5 x 165 P.O. box lessees	8⅓%		—	1013
					Total per working day....	3713 hours

DELIVERY

D. Offices with a traffic of over 500,000 articles per working day.

Sorting	Number of articles	Parts into which mail has to be sorted	Percentage which is fully sorted	Standard rate of sorting	Number of articles to be subjected to a further sorting	Number of working hours
		Mechanical sorting				
first	2,160,000	*At the Head Office*: 200 rounds of the Head Office;	13 1/3 %	3000		720 per 3 *Transorma* Sorting Machines each with 30 keyboards and 300 receptacles (type A30/300)
		90 P.O. box lessees of the Head Office;	2 1/3 %			
		5 groups of P.O. box lessees of the Head Office;	0 %			
		5 parts for the 5 District Offices (for each District Office the mail for delivery and for the P.O. boxes together)	0 %		1,821,000	
second	1,821,000	*At the Head Office*: 110 P.O. box lessees (by hand)	1 %	1600	—	14
		At the 5 District Offices: 5 x 200 rounds				
		5 x 200 P.O. box lessees	83 1/3 %	3000	—	600 per 5 *Transorma* Sorting Machines each with 5 keyboards and 400 receptacles (type A 5/400)
					Total per working day....	1334 hours

With mechanical sorting a gain of 2379 hours per working day.

Advantages of mechanical sorting with a Transorma Sorting Installation:
Speeding up of the handling of the traffic;
a 64 % saving of personnel expenses.

NOTE TO SCHEME D.

In a town of any size, if deliveries are made from a central point, all postmen will be obliged to cover long distances every day in going from their homes to the Delivery Office, and from that office to the starting points of their rounds. Apart from this being uneconomical, these long distances entail loss of time, and therefore cause delays in the delivery of mail. In some cases attempts have been made to reduce the delay by conveying the postmen to the starting points of their rounds by tram or car, but this, too, takes up considerable time.

The best solution is to be found in the decentralization of deliveries; instead of one central Delivery Office there are several, each covering a certain quarter of the town.

In addition to the saving of time just mentioned, there is the further advantage that there are better opportunities of establishing well-equipped buildings in suburban districts than in the centre of a town. As the volume of mail increases, difficulties are repeatedly experienced in securing the necessary space for extension of the building. Moreover, generally speaking the centre of a town does not afford good housing facilities for postmen; suburbs offer more possibilities in this respect. Consequently, it is more likely that postmen will there be able to live in the immediate neighbourhood of the office they serve than if there is only one central office. This will considerably shorten distances they have to cover several times a day to and from the office, to the benefit of their work.

In decentralizing the delivery service, some of the advantages resulting from the handling of large quantities of mail are inevitably sacrificed. Every endeavour must be made to retain these whenever possible. Some of the preliminary sorting can, therefore, be most effectively accomplished at the Head Office.

In the statement attached hereto, deliveries of mail in the town are effected from the Head Office and five District Offices, preliminary sorting being carried out at the Head Office, where the mail is sorted into the necessary number of sections. The second sorting takes place at the offices from which the mail is delivered. In the case of the mail sorted by hand, a third sorting of letters destined for District Offices is unavoidable.

For mechanical sorting a Transorma Sorting Installation can be used at all the offices. At the Head Delivery Office there is an installation consisting of 3 machines, each with 30 keyboards and 300 receptacles.

Apart from the fact that the Head Office's mail is sorted straightaway for the delivery rounds, that destined for District Offices is so sorted that only one further sorting is required at each of these offices for it to be finally ready for distribution. At each of the five District Offices there is a Transorma Sorting Installation with five keyboards and 400 receptacles.

Mechanical sorting entails the following advantages:
Quicker handling of the mail;
64% saved on the wages of personnel;
less time and labour spent on collecting letters from receptacles labelled for the same destination.

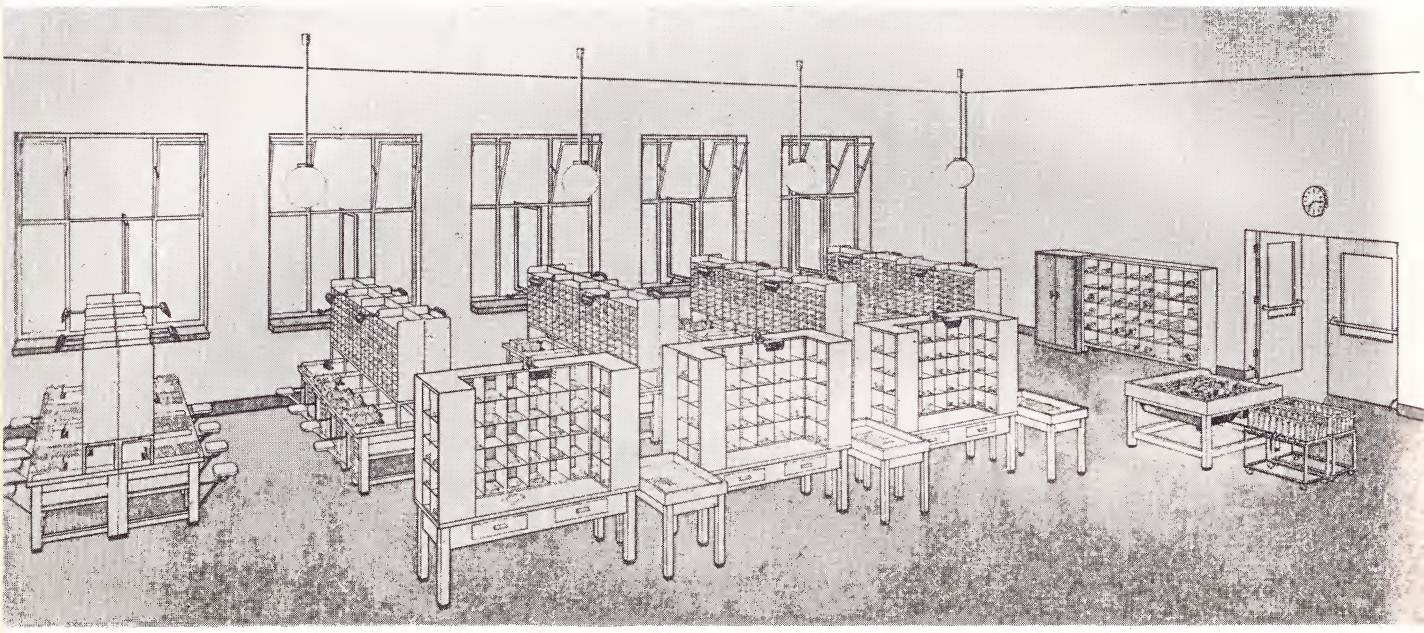
The advantages to be derived in any given case are easily calculated by substituting the actual figures for those mentioned in the examples. It is not necessary to point out that the percentage of mail fully sorted in a single round differs in the case of each country. The percentage of mail destined for lessees of P.O. boxes at Post Offices in different countries also varies.

But everywhere the same system can be applied to great advantage. To determine the financial benefit, the amount saved on wages must be reduced by the annual amounts written off for depreciation and those for maintenance of the sorting installation.

In many cases it will be possible to use the installation to sort both for dispatch and delivery at the same or at different times. An arrangement may be made, for example, whereby in the case of a machine with 300 receptacles, 140 are used for purposes of dispatch and 160 for delivery. Should all the keyboards and all the receptacles be required for each separate sorting, after having been used, for instance, for purposes of dispatch, the machine can serve to sort the mail received for delivery, or vice versa.

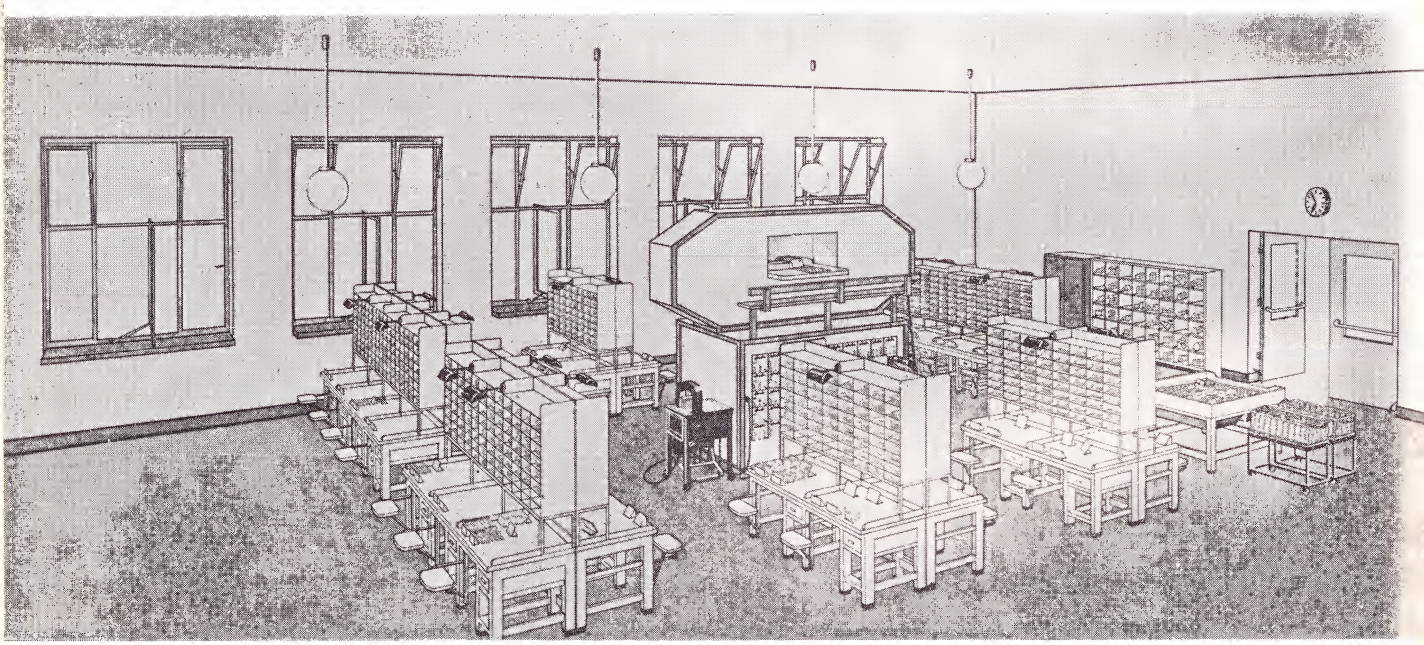
The financial benefit to be obtained is then considerably greater, since the amounts for maintenance and depreciation of the sorting installation must only once be deducted from the total amount saved in both departments on the wages of personnel.

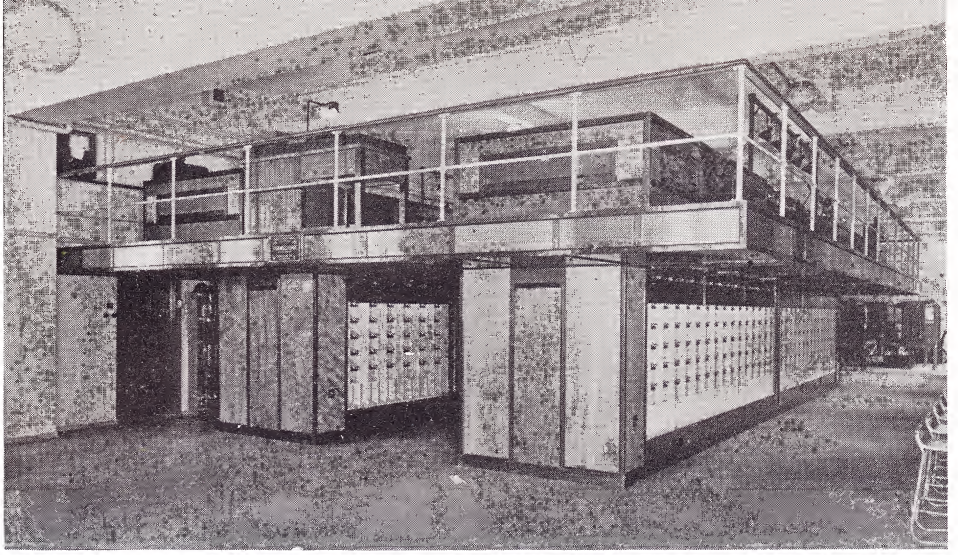
In view of the possible variations in the construction of the machines, the makers should be asked for a quotation in each particular case (figs. 22 and 23).



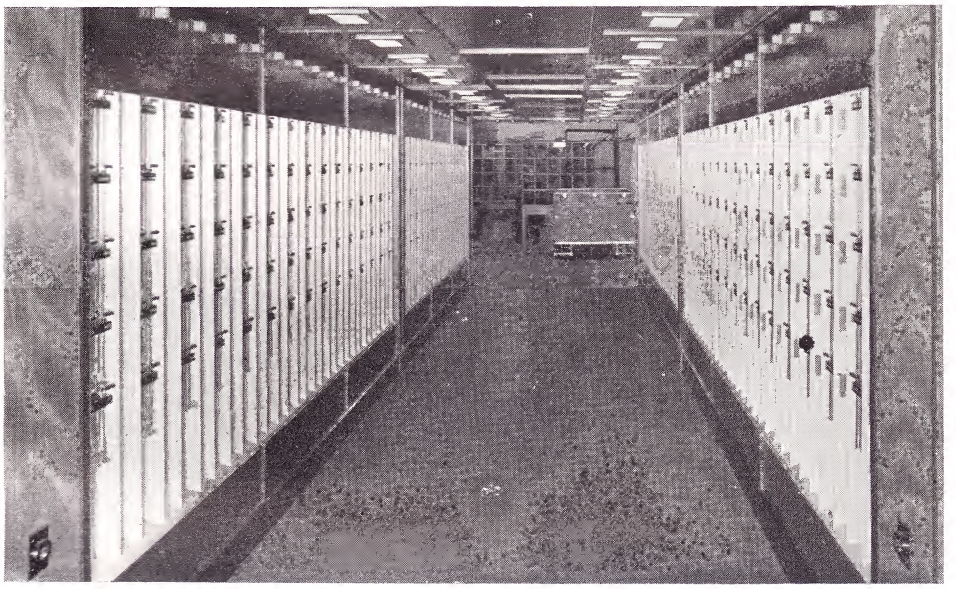
22. Interior of the Delivery Department at a Post Office where sorting is done by hand.

23. Interior of the same Department after the installation of a Transorma Sorting Machine A 1/100.



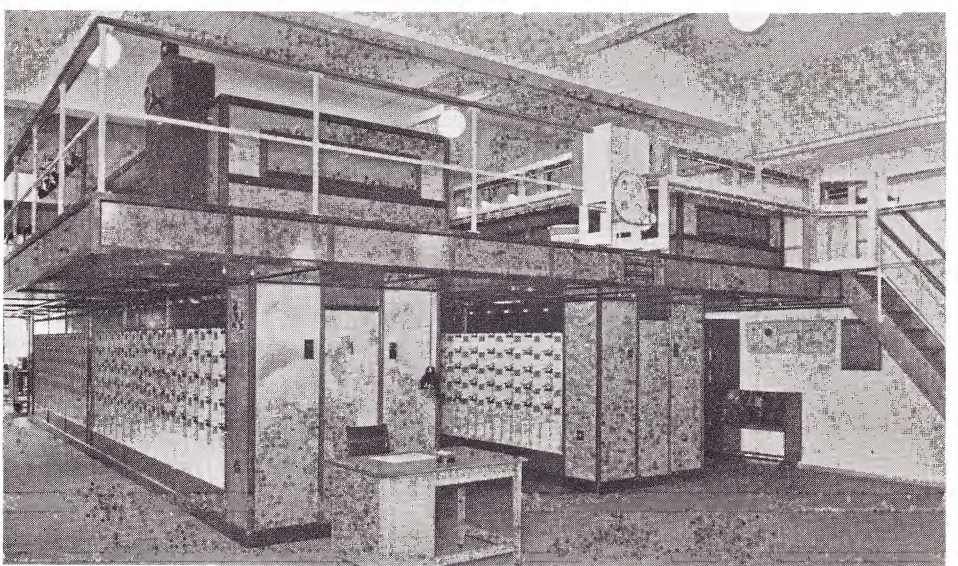


24. Transorma Sorting Installation in the Delivery Department of the Rotterdam Post Office (side view).



25. Transorma Sorting Installation in the Delivery Department of the Rotterdam Post Office (passage between the two machines).

26. Transorma Sorting Installation in the Delivery Department of the Rotterdam Post Office (front view).



Apart from the saving in time and money, the following advantages, which cannot be assessed directly in terms of cash, are derived from the application of mechanical sorting by means of a Transorma Sorting Machine:

a) A high sorting speed of 3000 articles per hour. In the case of sorting by hand, the maximum speed attainable is 1600 articles per hour.

b) In the case of mechanical sorting, the sorting of mail for several hundreds of destinations can be effected in one single operation by less experienced staff.

c) The fact that postal-matter handled at different keyboards is automatically deposited by the machines in the same receptacle renders further collection unnecessary. This entails a great simplification of transport, and precludes mistakes due to a faulty combination of batches of mail.

d) The articles to be sorted are brought within easy reach of the "transormist", each letter being automatically placed on the same spot in front of him. A slight movement of the hand is all that is required to deal with each article (fig. 27).

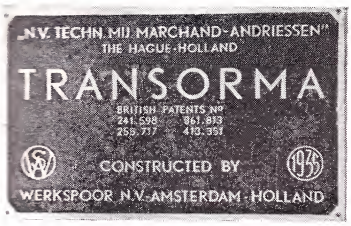
e) The number of articles sorted is registered by means of a counting device, affording an additional check on the output of the staff.

f) Each article sorted can be automatically stamped with a postmark indicating the date of arrival and/or the delivery in which it is included, thus eliminating the extra time needed for this purpose in the case of sorting by hand.

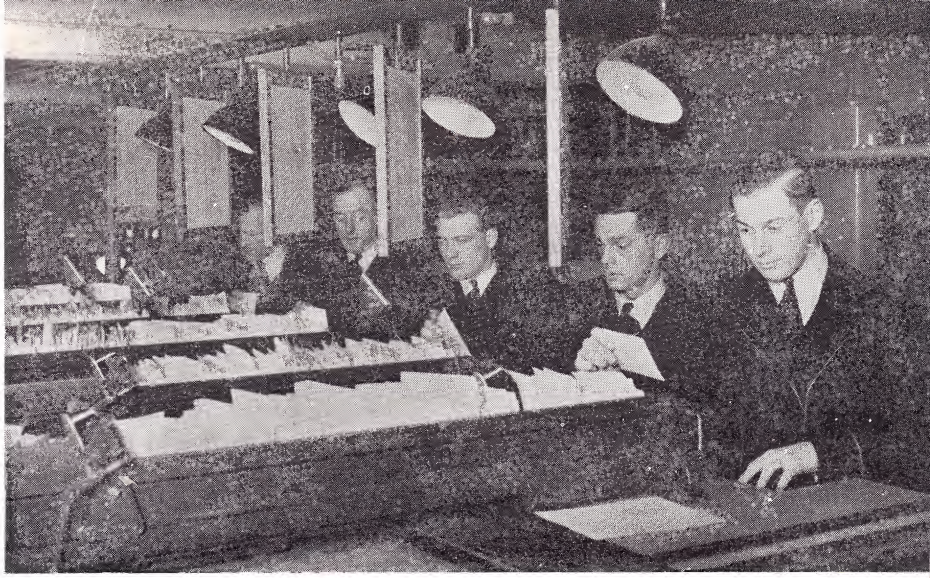
g) A simplification of the necessary supervision by reducing the number of contrivances used.

h) The number of supervisors can be reduced, because the amount of work done by each member of the staff is automatically registered by the machine, and less personnel is required than in the case of sorting by hand.

i) The machine sorts the correspondence into receptacles, in which it is stacked in regular piles. In the case of sorting by hand, this stacking depends on the neatness of the individual sorter.



28. Name-plate.



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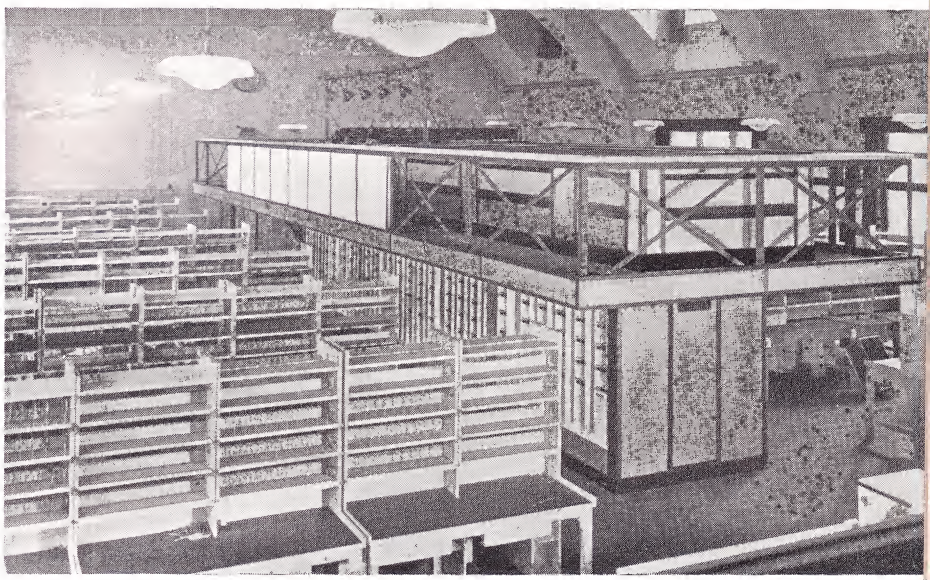

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27. Transorma Sorting Machine in operation at Brighton (England).

29. Transorma Sorting Machine in the Delivery Department of the Berlin-Steglitz District Post Office.

30. Transorma Sorting Machine used by both the Dispatch and Delivery Departments of the Munich-Gladbach Post Office.

30

j) In using the Transorma Sorting Installation, the letters are dropped into a slot from which the receptacles are placed at some distance. Consequently, the emptying of the receptacles in no way disturbs those operating the machines.

k) The area of operation in the sorting machine is the keyboard, which can quite easily be lighted artificially. To obtain a similar effect with a sorting-case, all the pigeon-holes would have to be lighted.

After the preliminary sorting of the mail has taken place, it is taken to the department — either in the same or in a District Office — where each postman puts the finishing touch to the correspondence handed him for delivery, before starting on his round. Mail destined for a District Office has to be bundled, for which purpose the Transorma Bundling and Sealing Machine can be used to advantage. The letters are then arranged in the order in which they are to be delivered to the various addressees. The sorting sometimes takes place on top of a table, sometimes in sorting-cases. The most suitable equipment generally consists of a case containing a series of pigeon-holes, which is placed on a table.

The number of sections into which the mail is split varies according to the quantity to be delivered and the nature of the district in which deliveries are to be made. In the course of sorting the mail, correspondence for delivery to addressees who regularly receive a great many letters can be deposited straightaway in separate pigeon-holes.

The pigeon-holes are then emptied, the contents of each being arranged in the order in which letters are to be delivered, and after all the sorted mail has been gradually collected, the postman can start on his round through the streets, up and down front-door steps, up and down flights of stairs, unless ..... blocks of houses, flats, hotels and other large buildings are equipped with a Transorma Sorting Installation specially designed for this purpose, whereby the mail to be distributed among the various occupants can be delivered to them from a central point, without giving the postman any extra work (fig. 54).

Although this Transorma is somewhat different from the installations described in this Chapter, it applies the same principles for mechanical sorting. When it is used, the blocks of houses, flats, hotels and large public buildings are provided with a channel running along the roofs of the buildings, built in more or less the same way as the channels now

installed in some blocks of houses for the passage of cables, gas-pipes and hotwater-pipes.

At regular distances along these channels carriers are placed, in which, as in the case of the other sorting machines, the postal articles are transported inside the sorting installation. At a central point a keyboard with slot is installed for operation by someone appointed for such purpose.

The letters, etc., destined for the block of buildings are collected at the Post Office and without any preliminary sorting, taken to the spot where the Transorma installation is operated. On arrival at this central point, the postal articles are dropped haphazard into the slot near the keyboard, the house number of the addressee being pressed on this keyboard for each letter. The articles are received by the carriers, which drop them into vertical chutes leading to the apartments of the tenants. The latter can be notified of the arrival of post by means of a signal.

The speed at which the letters are conveyed to their destination depends on the number of carriers with which the installation is equipped. Since delivery on foot within the building is replaced by mechanical transport, it need not be pointed out that this is a quicker method of delivery than the one now followed.

Besides being employed by the postal service, such a distributing-installation can also be used by publishers of newspapers for distributing papers amongst subscribers occupying the same building.

CHAPTER IV

MANUAL FOR THE TRAINING OF TRANSORMISTS

GENERAL RULES

Instruction.

The course for the training of staff as Transormists is held under the direction of an instructor, who should be thoroughly familiar with the working of a Transorma Sorting Installation before the course begins, so as to be able to give pupils some idea of how it operates.

Admission to the course.

The course may be attented by:

a. pupils already trained in sorting by hand;
b. pupils who have not had such training.

Naturally, group *a* will not require the training in topography nor instruction about how the town is divided into delivery rounds, P.O. box lessees, etc., as dealt with later in this chapter.

Training.

The Transormists are trained to meet the requirements of the department in which they are to be employed in their offices:

1. exclusively for the sorting of out-going mail;
2. exclusively for the sorting of incoming mail;
3. for the sorting of both kinds of mail.

Time-table.

The training occupies six hours per day, i.e. two periods of three hours separated by an interval of two hours. The programme allotted to the first period may be repeated in the second.

When there are six pupils, for instance, the curriculum suggested is as follows:

Hours of instruction from 9 to 12 a.m. and from 2 to 5 p.m.

Names	9.00-9.30	9.30-10.00	10.00-10.30	10.30-11.00	11.00-11.30	11.30-12.00
A	a	c	b	a	c	b
B	a	c	b	a	c	b
C	b	a	c	b	a	c
D	b	a	c	b	a	c
E	c	b	a	c	b	a
F	c	b	a	c	b	a

From 2 to 5 p.m. a repetition of the same time-table.

a: Practice on the keybord.
b: Chorus singing.
c: Card reversing.

It is assumed, that for purposes of training two keyboards are available, or that two keyboards of a Transorma Sorting Installation can be practised on simultaneously.

I. TRAINING OF TRANSORMISTS FOR THE SORTING OF OUTGOING MAIL.

DISPATCH.

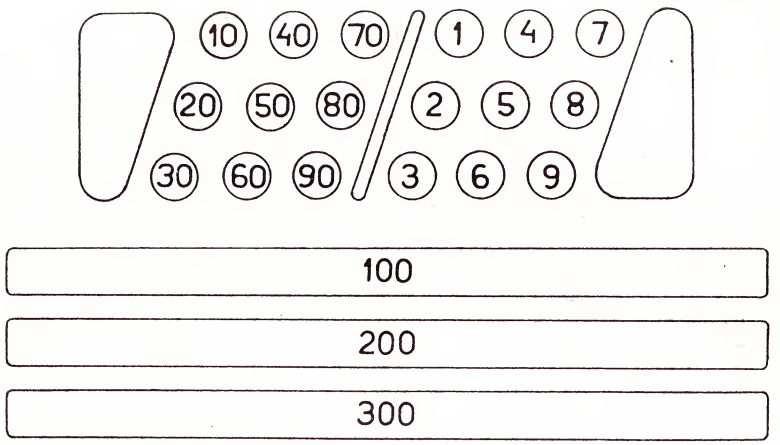
The training includes:

A. Keyboard exercises with use of cards bearing numbers.
B. Memorising the numbers allotted to local and foreign towns and routes according to the Transorma Sorting System.
C. Keyboard exercises with cards on which only destinations are given.

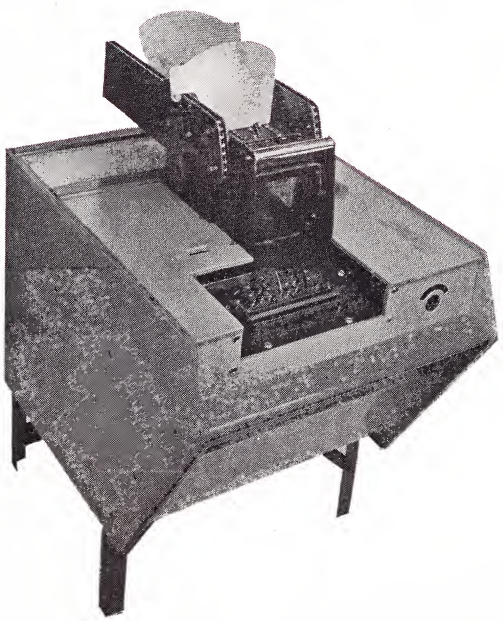
A. *Keyboard exercises with use of cards bearing numbers:*

Fingering.

Fig. 31 shows what the keyboard looks like.
The keys are depressed with the left hand as follows:
the units 1 to 9 with the forefinger,
the tens 10, 20 and 30 with the little finger,
the tens 40, 50 and 60 with the ringfinger,
the tens 70, 80 and 90 with the middle finger,
the hundreds with the thumb.



31. The Keyboard of the Transorma Sorting Machine Type A 5/300.



32. The Keyboard used for Training.

Position of the fingers.

In order to prevent pressure on other keys than where it is intended, the pupil should keep fingers not being used horizontally outstretched.

Position of the body.

The trunk must be held upright, whereas the position of the left forearm is parallel to the ground.

Keyboard exercises.

The pupil may practise on the keyboard of the sorting-machine, or on a special keyboard with precisely the same arrangement as that of the sorting-machine (fig. 32).

Cards are prepared bearing all the numbers which have to be depressed.

There are three categories of exercises:

without operation of the motor;
with a slowly rotating motor, the cards being dropped at the same time into the slot of the sorting-machine or training-keyboard;
with the motor rotating at normal speed.

Without operation of the motor.

The cards bearing numbers are placed in a pile on a table to the right of the pupil, who depresses the number appearing on each card on the keyboard, and then reverses the card.

The depression of the numbers takes place in the following order:

a. first each of the units 1 to 9 are depressed five times, then all numbers as they come to hand.
Number of cards required *45*

b. first each of the tens from 10 up to and including 90 are depressed five times, then in succession the tens 10, 40 and 70; 20, 50 and 80; 30, 60 and 90; after which all numbers as they come to hand.
Number of cards required *45*

c. the units 1 to 9 and the tens 10 to 90 as they come to hand;
Cards required: those of *series a and b*

d. the numbers 1 to 99 inclusive consecutively, then in whatever order they come to hand.
Number of cards required *99*

e. the numbers 100 to 199 inclusive, 200 to 299 inclusive, 300 to 399 inclusive first consecutively, then as they come to hand.
Number of cards required *300*

f. the complete series 1 to 399 inclusive, first consecutively, then in whatever order they come to hand.
Number of cards required *399*.

These exercises are based on the assumption that the Transorma Sorting Installation to be installed or already installed in the office has 400 receptacles. Should there be any variation in that number these exercises should, of course, be modified accordingly.

With a slowly rotating motor, the cards being dropped into the slot

After the pupil has sufficiently practised the above exercises and has acquired the necessary skill in depressing the keys, he or she is ready to learn how to combine depression of the keys with the simultaneous dropping of the cards into the slot of the training-keyboard or sorting-machine. The motor is adjusted to work slowly, e.g. a rate of 1000 articles per hour.

Use is made of the cushion to support the right arm. The position necessary for operating the sorting-machine is thus as nearly as possible imitated.

The tidy stacking of postal-matter in the receptacles depends on how it is dropped into the slot; in order to attain this the instructor should insist on cards being dropped in the left corner of the slot, with the longest side held upright.

The exercises consist in depressing the numbers mentioned above under *f*.

With the motor rotating more quickly.

The same exercises are repeated with the motor adjusted to rotate faster, and are continued for as long as is necessary. Gradually the speed is increased to 3000 articles per hour.

The paper ribbon.

By inserting paper rolls prepared for this purpose in the training-keyboard, it can be ascertained whether the keys have been correctly depressed, by comparing the numbers appearing on the ribbon with the numbers on the cards after the completion of each exercise. Special

care should be taken to ascertain whether the pupil has depressed wrong keys owing to an incorrect position of fingers not being used.

When a sorting-machine is available for training, a separate set of training cards should be prepared for each pupil, which can be identified by their shape or colour. When the sorted cards are removed from the receptacles, it can then be ascertained by whom a particular mistake in sorting has been made. It is advisable to put the printing device on the keyboard out of action during these exercises, so as to enable the sets of cards to be used repeatedly.

B. *Memorizing the numbers allotted to local and foreign towns and routes according to the Transorma Sorting System.*

Arrangement of the receptacles.

Statistics have determined:

a) the allotment of the receptacles of the sorting-installation to particular destinations;
b) the allotment of Transorma-numbers to these destinations.

To facilitate bundling, receptacles allotted to mail for destinations along the same route should as far as possible be in the same vicinity, whereas for towns and routes claiming the most correspondence, the lowest receptacles, i.e. those with sinking bottoms, should, when to be found in the sorting-installation, be reserved.

List of receptacles.

A list of receptacles is prepared, containing the names of all the various places for which mail has to be sorted, with mention of the corresponding Transorma-numbers. Each pupil receives a copy of this list.

Map.

A map of the *Home-Country* shows districts, places and routes numbered according to the Transorma Sorting System. Alongside the names of places and routes (which are encircled by a coloured line, a different colour being used for a town and route), Transorma-numbers appear on the map.

Foreign towns or routes allotted a receptacle in the sorting-installation, if not too numerous, are listed with mention of their Transorma-numbers

in the margin of the map of the home-country. When there are several foreign destinations, it is advisable to use a map of the world planned on the same lines as the above mentioned map of the home-country.

Cards.

Destinations are mentioned on one side of a set of cards, with their Transorma-numbers given on the back.

Memorizing the names of towns comprises:

a) chanting the names of towns with their corresponding Transorma-numbers in chorus;
b) reversing the cards.

Chanting in chorus.

The instructor points to a place on the map and mentions the Transorma-number; he repeats this with the pupils so often that the latter can mention the number of every place immediately it is pointed at. Whenever a new place is mentioned, those already memorized are repeated in chorus.

Reversing the Cards.

After memorizing a few of the places, the cards containing their names on one side and their Transorma-numbers on the other, are handed to the pupils. The latter read the destination mentioned on the face of the card, recite the corresponding Transorma-number and then ascertain by reversing the card whether the number given was correct. Every now and again pupils are handed cards for a new batch of freshly memorized places.

As soon as these have been properly memorized by reversing the respective cards, these cards are added to those already memorized. These exercises in reversing cards must be repeated regularly, for they constitute an important part of the training.

When all the places have been memorized, the pupil should be able to reverse cards at the rate of 3000 per hour, to be checked by use of a metronome. The instructor should keep himself fully informed about the progress made by his pupils, each of whom should be tested at least once a week.

Training for hand-sorting.

If the instructor deems it necessary, pupils who have had no previous training in sorting by hand must also be taught to use the hand-sorting

cases at the office. Alongside the place-names of destinations, their corresponding Transorma-numbers are marked on the receptacles of the sorting-cases.

In this way the pupils learn to base their sorting on these numbers and even experienced hand-sorters will find working with these Transorma-numbers highly profitable.

C. *Keyboard exercises with cards on which only destinations are given.*

These exercises are commenced as soon as pupils have mastered the keyboard exercises mentioned under A and are thoroughly conversant with the Transorma-numbers for the names of towns.

Practical exercises.

As soon as the instructor considers a pupil to have mastered these exercises, the latter is allowed to sort mail on the sorting-installation.

The rate is gradually increased according as the pupil acquires routine. To pass the final test pupils should be able to sort 3000 articles per hour without a mistake.

II. THE TRAINING OF TRANSORMISTS TO SORT INCOMING MAIL.

DELIVERY.

The training includes:

A. Keyboard exercises with use of cards only bearing numbers.
B. Memorizing (with the corresponding Transorma-number):
   1) The names of streets on the various delivery rounds.
   2) The names of the P O. box lessees.
   3) The names of addressees who regularly receive a great deal of correspondence, i.e. the so-called "big customers".
   4) The names of addressees whose correspondence is generally received without mention of an address.
C. Keyboard exercises with use of cards only bearing addresses.

A. *Keyboard exercises with use of cards only bearing numbers.*

Reference should here be made to what has been said about these exercises under the heading "*Dispatch*".

B. *Memorizing the names of streets, P.O. box lessees, etc.*

Plan.

All delivery rounds are marked in different colours on a plan of the town, with mention of the Transorma-number for each round. As far as possible it is advisable to arrange the rounds to include the whole of a street. If for any reason this is impracticable, then the street should be split up into as few rounds as possible, divisions being made at easily remembered points.

List of delivery rounds.

A list of all delivery rounds is drawn up with mention of the names of streets or parts thereof contained in each round, e.g.:

312	Street A	from numbers 2 to 68 inclusive;
		from numbers 1 to 73 inclusive;
	Street B;	
	Road C;	
	Avenue D;	from numbers 2 to 102 inclusive;
		from numbers 1 to 113 inclusive;
	E. Lane; etc.	

Memorizing the names of streets.

As described under the heading "Dispatch", the instructor points on a plan of the town to the streets contained in a delivery round, mentioning their names over and over again until the pupils can repeat them without hesitation.

As soon as a number of rounds, dependent on the number of streets included therein, have been memorized, practical use is made of the knowledge gained by means of cards, on the face of which the name of a street (possibly with numbers) and on the back of which the Transorma-number is given. This reversing of the cards is continued until the pupils know the names of all the streets by heart.

See also in this connection the paragraph on "Reversing the Cards" under the heading "*Dispatch*".

P.O. box Lessees.

The pupils are taught to memorize the names of P.O. box lessees listed alphabetically in groups of fifty. The instructor goes on

repeating their names and addresses aloud until the pupils know them by heart.

Cards are then prepared to enable the pupils to practise the exercises involving their reversal.

Big Customers.

After making a list containing the names and addresses of the big customers and their Transorma-numbers, these are memorized in the manner described for P.O. box lessees.

Mail without indication of an address.

A list is made of the names and addresses of those addressees who regularly receive correspondence without mention of an address. The instructor repeats these aloud with the pupils until they know them by heart.

Cards are then prepared so that the pupils can start the card-reversing exercises. On one side of the card the name is given, on the other the full address and Transorma-number of the round which includes the addressee's residence.

When the pupils have memorized these addresses, the cards of the P.O. box lessees are shuffled amongst them, and then the card-reversing exercises are repeated. After these have been mastered, all the cards, i.e. those mentioned in groups 1 to 4 inclusive, are shuffled together and the card-reversing exercises are repeated until the pupil is capable of dealing with all the cards correctly without hesitation.

C. *Keyboard exercises with use of cards on which only names and addresses are given.*

When to begin these exercises.

A start can be made with these exercises as soon as pupils have acquired sufficient technique to depress the keys without mistakes and can state the Transorma-number for every street, P.O. box lessee, etc., without any hesitation.

For the course of further training and promotion to the next stage of operating the machine, reference should be made to section I under the heading "*Dispatch*".

III. THE TRAINING OF TRANSORMISTS FOR THE SORTING OF BOTH INCOMING AND OUTGOING MAIL.

At offices where the volume of mail permits, it may be necessary for Transormists to sort both kinds of mail, either simultaneously or in succession.

In view of what has been said in sections I and II the training will present no difficulties.

CHAPTER V

THE POSTAL-CHEQUE, MONEY-TRANSFER AND CLEARING SERVICES

When speaking of the Post we involuntarily think of the letter post proper, with its bright coloured pillar-boxes and popular postmen. Indeed, the backbone of the Postal Service is and will always be the transport of letters or conveyance of thoughts committed to writing and it is easy to understand why in several countries, partly on the ground of economic considerations, the Post's original task was gradually extended to include the rapid communication of thoughts, made possible by the telegraph and later by the telephone.

But the word "Post" is now used in various contexts for the

parcel post service,
money order service,
postal service for the collection of bills,
Post-Office Savings Bank,
postal service for payment of subscriptions to papers and periodicals,

and for the Benjamin of the family, the Postal-Cheque and Money-Transfer Service, founded on an international basis at Madrid in 1920.

Except in the case of the Post-Office Savings Bank, in many countries these auxiliary services have both an internal as well as an international existence.

As proof of the magnitude of the International Postal Service it may be mentioned that the Union Postale Universelle now consists of 88 countries with votes, of which 72 have a parcel post, 59 a money order service, and some 30 a postal subscription, postal-cheque and money-transfer service, all operating on a uniformly organised, international basis, usually run alongside the corresponding service for the country itself.

Moreover, there are purely national services in various countries, entailing payments at Post-Offices on behalf of the Treasury (the collection of taxes), the social services, such as national insurance against accident, illness, unemployment, etc.

Obviously the Postal Service with its numerous offices situated in every locality and its vast number of ambulatory Post-Offices (facteurs ruraux) is eminently suited to run these auxiliary services.

However, here we have to discuss its youngest offspring, the Postal-Cheque and Money-Transfer Service, with its mass of documents, essentially the same everywhere. How does this service function?

A, *B*, *C*, to *Z* inclusive, are holders of current accounts into which they have paid a certain amount (by means of a paying-in slip). *A* has to pay an amount to *B*, *B* to *C*, *C* to *D*, etc.

A transfers the amount in question for credit to *B*'s account (by means of a transfer-slip). *B*, *C*, etc. may do likewise, until at last the current account holder *X* desires payment in cash, which he draws out of the Postal-Cheque and Money-Transfer Department (by means of a cheque, money-order or the like).

The debiting and crediting, which does not alter the *total* of the balances in the accounts concerned, is the main feature of the Postal-Cheque and Money-Transfer Service. In a well run service the number of transfers (i.e., transactions not involving the payment of cash) amounts to between 85 and 90 per cent of the total number of transactions which include cash paid in and cheques paid out.

The Post-Offices act as cashiers: they receive the amounts paid in, cash cheques, money-orders, etc., give information; in short, they are more or less branch offices of the Central Money-Transfer Office.

There are countries with one Central Money-Transfer Office, others with more than one. As far as we know, nowhere does each Post-Office any longer operate independently as a Money-Transfer Office. It is difficult to lay down a hard and fast rule as to whether it is advisable that there should be one Central Money-Transfer Office, or whether a certain amount of decentralization — be it on a limited scale — is to be preferred.

The following factors greatly influence any decision on this point:

the size of the country,
the density of population,
the ratio of large towns to rural districts,
the existence of rapid and frequent transport facilities.

In addition to the ordinary routine work, all cheque and money-transfer services involve a considerable amount of preliminary work

that is necessary for purposes of administration, besides a great deal of subsequent work to complete it.

The routine work consists of a series of bookings to effect the various debit and credit entries in the accounts in order to obtain the new balance. The work entailed is quite simple, accuracy being of primary importance. All entries should be so made as to leave the least possible margin for mistakes and should be systematically checked in such a way that any mistake would be discovered immediately and traced to within a certain number of accounts. In most countries this is attained by entrusting the keeping of a certain group of accounts to a certain number of employees, who deal with these quite independently of other groups.

Within the group the entries are made independently by two different employees, each of whom works out the new balance, comparing the final figures afterwards.

By way of a check it is seen whether the sum total of the amounts debited or credited to the accounts corresponds with the total obtained from the slips. A final check is then required to ascertain the balance due on all the accounts dealt with at the Money-Transfer Office.

These operations are such that machines can be used to advantage. All sorts of mechanical appliances for counting, calculating and book-keeping are on the market. In most countries it was immediately realized that mechanical labour would save a great deal of time and work and consequently in practically all Postal-Cheque and Money-Transfer Offices such machines are in use.

Attempts have also been made to find a mechanical solution for the other operations. Machines are frequently used to open the envelopes containing creditors' instructions, and also to seal automatically the envelopes containing a statement of their accounts for creditors; whereas stamping and perforating machines are used to stamp or perforate the date on these statements.

The Transorma Bundling and Sealing Machines "B.S.M.", described in the chapter on guiding principles for modernization, are also of valuable assistance in saving time in tying up bundles of envelopes and forms.

The sorting to be done at a Postal-Cheque and Money-Transfer Office constitutes the bulk of the work and costs most time. Day in,

day out, the following documents have to be sorted according to number:

1) the instructions received from creditors according to the number of the account to be debited;
2) the same instructions according to the number of the account to be credited, irrespective of whether the accounts are kept at the office in question or at another office in the country.

Various methods can be used for sorting these documents. The two principal are:

1) The decimal system is applied to each round of sorting, that is to say, in each round the documents are sorted into ten groups.
2) In each round the documents are sorted into as many groups as sorting by hand permits, i.e., for example, into 50 or 60 groups.

In the case of the first method, which will be referred to as handsorting method A, the number of rounds required to arrive at a final sorting of hundreds is rather large. If the highest number of an account is above 100,000, at least three and if it is above 200,000 at least four rounds would be required.

One round of sorting might be saved for sorting one of the hundred thousands — selected because it includes the most frequently operated on accounts — straightaway into ten groups in the first round, instead of sorting exclusively in hundred thousands. In this way a division is made in the first round into somewhat more than ten groups.

One of the advantages of handsorting by method A is that sorting tables can be used, enabling the sorters to be seated whilst at work. Owing to this and the small number of groups into which the documents are sorted, it is possible for the rate of sorting to be very high. Practical tests have shown that, taking into account all the factors described under the heading "Dispatch" in the chapter on guiding principles for modernization, this speed was:

5000 articles per hour as far as the sorting of paying-in slips, transferforms and cheques was concerned,

3500 per hour for the sorting of envelopes.

It is not necessary to sort envelopes containing creditors' instructions. It is also possible to open them first and then sort the contents; but it

should be borne in mind that as a rule each envelope contains more instructions than one.

By first sorting the envelopes and then emptying them, the work to be done is at least reduced by half, provided the number of the account is mentioned on the envelope. In order to encourage this practice special facilities may be granted.

In some countries a creditor is supplied with envelopes on which the number of his account is printed. Sometimes the use of these envelopes is compulsory; in other cases they may be sent in post free, whereas postage must be paid when other envelopes are used.

The second method, hereinafter referred to as hand-sorting by method B, has the advantage of effecting the sorting in fewer rounds, though it entails more disadvantages than the first method. In the first place the sorting has to be done at sorting cases, which necessitates standing if a reasonable speed is to be attained, involving all the unpleasant consequences thereof. Moreover, the rate of sorting is not high.

As in many respects the sorting resembles that of sorting ordinary mail at Post Offices it would be plausible to accept a standard rate of 1600 documents per hour. However, the articles concerned are of the same or about the same size, whilst no special technical knowledge, looking up towns, etc., is required, these factors exercising a favourable influence on the rate of sorting. Practical tests have shown that an average of 2000 articles can be sorted per hour.

The most efficacious and quickest method is to use Transorma Sorting Machines for sorting the numbers of the accounts straightaway into groups of hundreds, thousands, or tens of thousands in a single round.

The Belgian Postal-Cheque and Money-Transfer Service, for instance, sorts in the *first* round by means of a Transorma Sorting Machine furnished with five keyboards 40,000 numbers straightaway into hundreds for 400 of the 500 receptacles associated with this machine and in the same round the numbers above 40,000 are sorted into tens of thousands for the remaining 100 receptacles.

In the *second* round each group of tens of thousands is sorted into hundreds for 100 receptacles by a separate Transormist, so that five groups of tens of thousands are regularly handled simultaneously and divided into groups of hundreds.

It is also possible in one round of sorting to sort the numbers of

accounts according to the various groups of the Current Account Department. To this end Transorma Sorting Machines can be supplied in any desired form. During the mechanical sorting only the contents of each receptacle have to be arranged according to number, for which purpose the machines can be provided with a tray near the receptacles.

The tables given on page 82/83 show the time required for sorting by each of the methods described above and clearly reveal how much time can be saved on the process. The following points should be noted:

1) It is assumed that there are 300,000 creditors, the first 100,000 of which make the most operations on their accounts, sending in on an average half the total number of transfer instructions.

2) All methods of sorting demand a certain interval for the transport of documents from one round of sorting to the other and for finally disposing of the articles sorted. Thus the more rounds of sorting, the more hours are required for transport and tidying up. The number of hours mentioned in the tables were obtained as the result of practical tests in relation to the number of transfer-documents specified, and may be accepted as representing averages. The advantages of applying the Transorma Sorting-method are obvious; very few hours are required for transport and tidying up, because practically all this work is done automatically by the machines in the course of sorting; and furthermore the great saving in this kind of work considerably reduces the risk of losing documents during transport.

In order to estimate how much time might be saved in a given case a table must be prepared for that purpose. What type of sorting machine is most suitable for the object in mind must be determined in each instance. The net saving in terms of money is obtained by deducting the annual instalments payable for purchase and maintenance of the Transorma Sorting Machine from the amount calculated to have been saved on the wages of personnel. In view of the many variations possible in the construction of the different installations, the manufacturers should be consulted in every case.

Advantages not to be assessed in terms of money:

1) The possibility of earlier closing hours for the whole department.
2) Simplification of transport, because documents relating to the same group of numbers or places dealt with at all the keyboards of a machine are automatically deposited in one receptacle.

3) Less danger of losing documents during the process of sorting them.
4) The possibility of tracing by whom an error in sorting has been made.
5) The possibility of checking the output of personnel.
6) Easier supervision of the work in general.
7) The whole system being based on applying the decimal system, no tax is imposed on the Transormist's memory.
8) There is no objection to entrusting the entire personnel of the "Current Account Department" with the operation of sorting-machines, so that a very wide margin of reserve sorters would be available.
9) A greater sense of responsibility, because the sorters are themselves interested in sorting correctly.

Mechanization of the work of sorting not only speeds up that work, but also makes it possible to hasten the completion of work that has to be done after it.

COMPARISON OF THE RESULTS OBTAINED IN SORTING POSTAL-CHEQUES AND MONEY-TRANSFER DOCUMENTS BY HAND AND BY MEANS OF THE TRANSORMA SORTING MACHINE THE NUMBER OF CREDITORS IS ASSUMED TO BE 300,000

Hand sorting

Articles to be sorted		Sorting rounds	Number of sorting manipulations in each round	Sorting-Divisions		Average rate of sorting per hour	Number of hours devoted to sorting	Number of hours required for transporting and arranging sorted documents	Total number of working hours
kind	number			number	denomination				
					METHOD A				
envelopes	100,000	1st	100,000	12	a) the number 1-100,000 into tens of thousands, i.e., 10 groups b) the numbers 100,001-200,000 into one group c) the numbers 200,001-300,000 into another group	3500	28½		
		2nd	50,000	20	a) the numbers 100,001-200,000 into tens of thousands, i.e., 10 groups b) the numbers 200,001-300,000 into tens of thousands, i.e., 10 groups	3500	14½		
		3rd	100,000	300	every group of tens of thousands into 10 groups of thousands	3500	28½		
		4th	100,000	3000	every group of thousands into 10 groups of hundreds	3500	28½	30	130
paying-in slips cheques transfer-slips	100,000 100,000 200,000	1st	400,000	12	a) the numbers 1-100,000 into tens of thousands, i.e., 10 groups b) the numbers 100,001-200,000 into one group c) the numbers 200,001-300,000 into another group	5000	80		
		2nd	200,000	20	a) the numbers 100,001-200,000 into tens of thousands, i.e., 10 groups b) the numbers 200,001-300,000 into tens of thousands, i.e., 10 groups	5000	40		
		3rd	400,000	300	every group of tens of thousands into 10 groups of thousands	5000	80		
		4th	400,000	3000	every group of thousands into 10 groups of hundreds	5000	80	120	400
	Total.....		1,750,000				Grand Total:.....		530

					METHOD B				
envelopes paying-in slips cheques transfer-slips	100,000 100,000 100,000 200,000	1st	500,000	60	into groups of five thousands	2000	250		
		2nd	500,000	3000	each group of five thousands into 50 groups of hundreds	2000	250	100	600
		Total	1,000,000					Grand Total.....	600

Transorma sorting

envelopes	100,000	1st	100,000	300	into groups of thousands	3200	$31\frac{1}{4}$		
		2nd (by hand)	100,000	3000	every group of thousands into groups of hundreds	3500	$28\frac{1}{2}$	5	$64\frac{3}{4}$
paying-in slips cheques transfer-slips	100,000 100,000 200,000	1st	400,000	300	into groups of thousands	4000	100		
		2nd (by hand	400,000	3000	every group of thousands into groups of hundreds	5000	80	$15\frac{1}{4}$	$195\frac{1}{4}$
		Total.....	1,000,000					Grand Total.....	260

NUMBER OF WORKING HOURS:

	Method A.	*Method B.*
Hand Sorting	530 hours	600 hours
Transorma Sorting ...	260 hours	260 hours
Time Gained:	270 hours	340 hours

CHAPTER VI

TECHNICAL DESCRIPTION OF THE TRANSORMA SORTING AND BUNDLING MACHINES

SORTING MACHINES.

As already mentioned, Transorma Sorting Machines can be used to advantage not only by the Postal Service, but also by private undertakings such as banks, mail-order houses, insurance companies and in short, by all businesses and institutions where much sorting has to be done.

The shape and size of the sorting machines are not rigidly fixed, and can be adapted to suit the dimensions of rooms in which installations are to be placed. Although there are differences of form in the various types of machines, their operation, as will be seen from the description that follows, is based on the same principle. These are the main types:

a) a small type with 100 or more receptacles, equipped with 1 keyboard;
b) a medium type with any desired number of receptacles, equipped with not more than 5 keyboards;
c) a large type with any desired number of receptacles, equipped with not more than 40 keyboards;
d) a large type with any desired number of receptacles, equipped with not more than 20 keyboards, especially designed for sorting postal-cheques, money-transfer documents and similar forms;
e) a large type with any desired number of receptacles, equipped with 1 or more keyboards, especially designed for use in large buildings, such as hotels, blocks of flats, etc.

The various types are indicated by means of fractional numbers, the numerator representing the number of keyboards and the denominator the number of receptacles. To indicate the purpose for which the machine is intended, the fraction is preceded by one of the following letters:

A. Machines for sorting incoming and outgoing mail.
B. Machines for sorting postal-cheques, money-transfer documents and similar forms.
C. Machines for use in large buildings, hotels, blocks of flats, etc. (fig. 54).

Consequently, type A 1/140 denotes a machine for sorting mail for purposes of dispatch or delivery containing 1 keyboard and 140 receptacles; B16/200 a machine for sorting postal-cheques or money-transfer documents, with 16 keyboards and 200 receptacles; and C 1/450 a machine with 1 keyboard whereby letters for the tenants of a large building are automatically conveyed from one central point to the 450 apartments.

In the case of all these types the rate of sorting is at least 3000 articles per operator, per keyboard and per hour.

Each type is described in detail hereunder, some degree of repetition being inevitable since it has been our purpose to give a comprehensive description of every type of machine.

The Transorma A 1/100.

This type of machine, as indicated by the letter A, is used for sorting incoming and outgoing mail. It displays the following features:

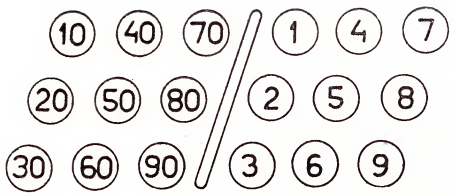
a. a single keyboard,
b. a transport mechanism,
c. a driving installation,
d. 100 receptacles.

In fig. 33 these parts are numbered (1-3), (4-5), (6), and(7) respectively. Moreover, the seat reserved for the operator (called the Transormist) is marked (9). In front of this is shown the top of a table (2), with the keyboard (1) and in the background the supply-trough (3), in which are placed the articles to be sorted. The chutes (8) lead into the back of the receptacles.

The Keyboard.

The articles to be sorted are placed in trays or baskets at the Transormist's side. At regular intervals the latter takes out a batch of letters and places them in the supply-trough (3), which is so arranged that the foremost letter of the batch is always to be found in the same place, within easy reach of the Transormist's right hand.

In front and on either side of the supply-trough is the top of a table (2), in which there is a narrow oblong opening, the slot, before which stands the keyboard consisting of 18 keys: 9 for the units and 9 for the tens (fig. 33—34). The transormist seated facing this keyboard, picks up the nearest letter from the trough with his right hand, reads the address and drops it into the slot.



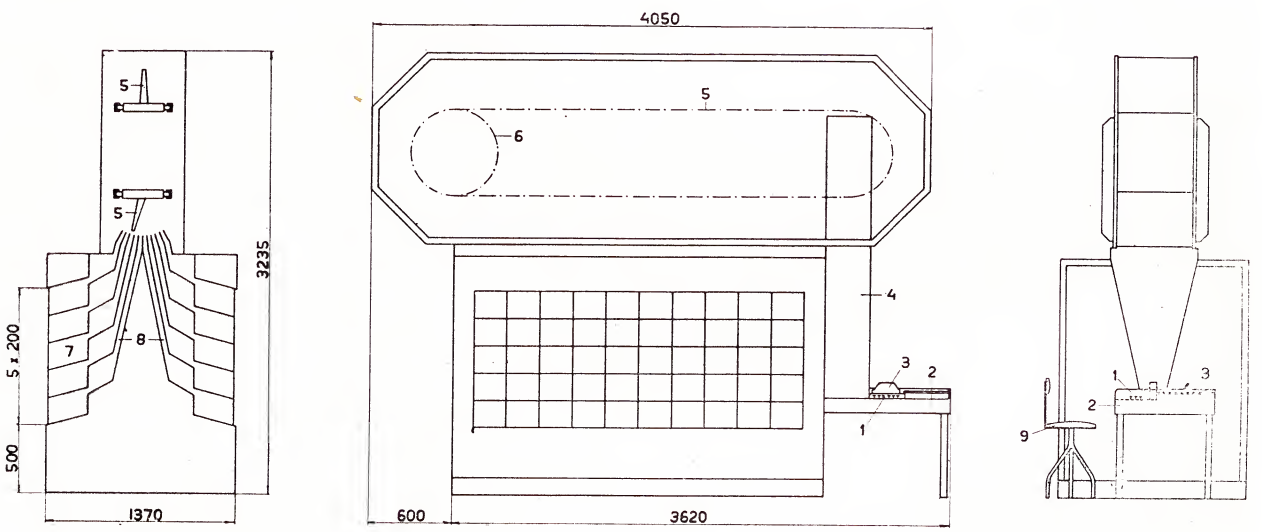
34. The Keyboard of the Transorma Sorting Machine Type A 1/100.

All this requires is merely a slight movement of the wrist, whilst the elbow and forearm are supported on a cushion lying on the table. At the same time as the letter is dropped into the slot, the number on the keyboard corresponding to the address is depressed with the left hand.

The keyboard is so constructed that it is quite easy to depress a "unit" key simultaneously with a "tens" key, although there is no objection to these being depressed successively. The keys are depressed "blind", that is to say, without looking at them. In order to facilitate correct fingering, there is a partition between the units and tens keys. Moreover, keys 40, 50, 60 and 4, 5, 6 are provided with a ribbed surface, whereas the other keys are somewhat concave.

After the Transormist has dropped the letter into the slot, it is shifted to the left by a mechanical transport device under the table, after which, via an aperture in the lining of the machine, it lands in a vertical transport device (4) which carries the letter up until it arrives in the ejection device.

This ejection device ejects the letter at the right moment into one



33. Diagram of a Transorma Sorting Machine Type A 1/100.

of the carriers forming an endless chain. A counter associated with the keyboard registers the number of articles that passes through the slot. It can be readjusted to zero by means of a key.

The Transport mechanism.

This consists of an endless chain of carriers (5), which are linked on to one another and travel regularly over a closed rail track in the vertical plane. It is their function to convey the articles dropped into the slot to the receptacles for which they are destined. Each carrier only conveys one article during a single circuit of the endless chain. Their speed is such that 3,000 articles can be transported per hour. Each carrier is composed of two cast-iron cross-bars, between which is suspended a narrow box called the letter-holder. This narrow letter-holder can swing round an imaginary horizontal axis running parallel with the track, thus rendering it possible to adjust the letter-holder in ten different oblique positions (inclinations).

The letter-holder, open at the top, is shut at the bottom by two valves. Pressure on a pawl on the carrier opens these valves, permitting the contents of the holder to be ejected from the bottom of the carrier. The carriers therefore perform two important functions:

1. Each letter-holder of the carrier can be given 10 different inclinations, thus enabling the sorting to be effected *at right angles* to the track.
2. On the bottom valves being opened, the article is ejected from the carrier, rendering it possible for the sorting to be effected *in the direction* of movement.

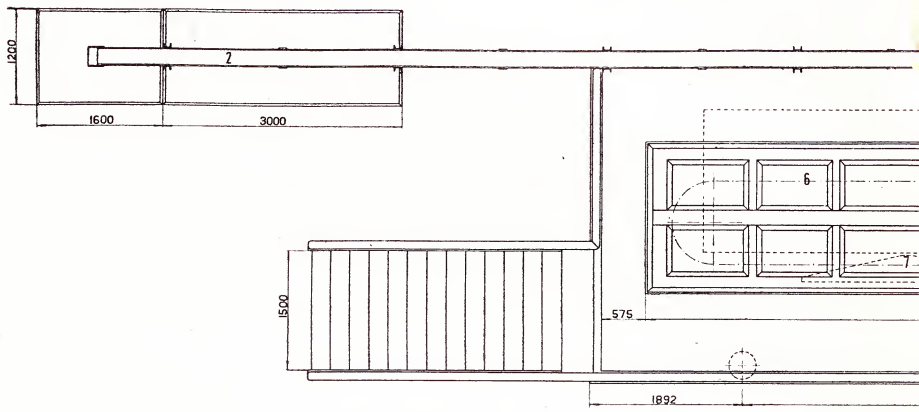
Each carrier is also provided with a number of adjustable selector-bars. The depression of keys on the keyboard actuates a combination of these selector-bars, ensuring that the letter-holder acquires the desired inclination and that the bottom valves open at the right moment.

The Driving Mechanism.

The endless chain is driven in one of the bends by a large chain wheel (6), which in turn is rotated by an electric motor of $\frac{1}{4}$ H.P.

The Receptacles (fig. 35).

Letters ejected from the bottom of the carriers pass through aluminium chutes (1) into the back of the receptacles (2). Before reaching the receptacles, from being transported vertically in these chutes, the position of the letters becomes almost horizontal. The front of each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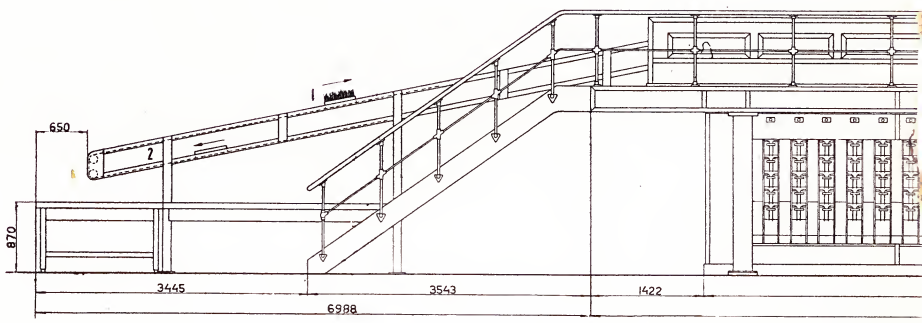
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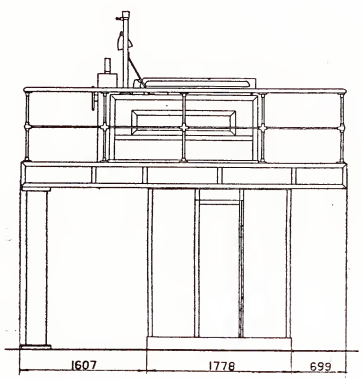
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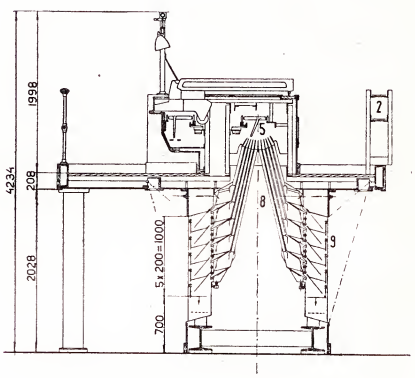
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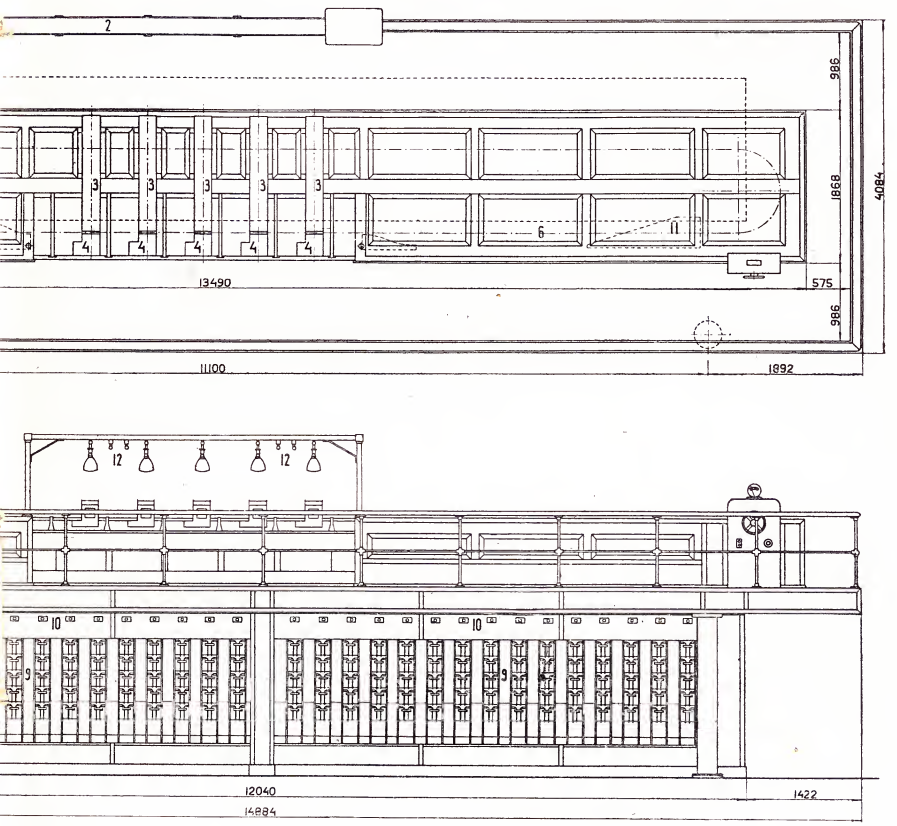


39. Diagram of the Transorma sorting machine type A 5/300.

1. Conveyor tray.
2. Conveyor band.
3. Supply trough.
4. Keyboard.
5. Letter carrier.
6. Carrier track.
7. Inclination device.
8. Sliding chutes.
9. Receptacles.
10. Signal lamps.
11. Resetting device.
12. Safety lamps.

receptacle is composed of two hinged bars of stainless steel (3), bearing a label (4) indicating the number and destination of the receptacle.

Owing to the speed at which letters enter the receptacles, there is danger of their jumping vertically; to prevent this, each receptacle is fitted with a celluloid plate (5). In the bottom of each receptacle there is an opening between the two bars to facilitate emptying. The depth of the receptacles is about 20 cm (8 in.).

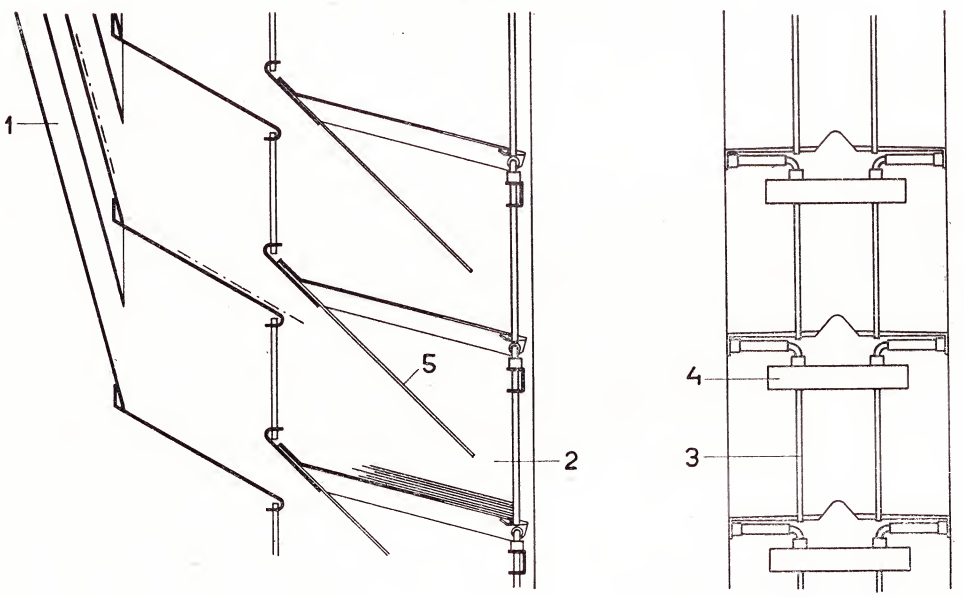
Encasement of the Machine.

The machine is provided with a wooden encasement containing shutters at various points to make it possible to reach any part of the interior without difficulty. An inner lining of celotex plates ensures practically noiseless running.

Operation of the Sorting Installation.

The mechanism of the machine is shown in fig. 36. The vertical transport installation is marked as (1), combined with the endless chain of carriers (2), the direction of motion being indicated by arrows. The drive (3) supplies the necessary power.

When a letter has been dropped into the slot associated with the

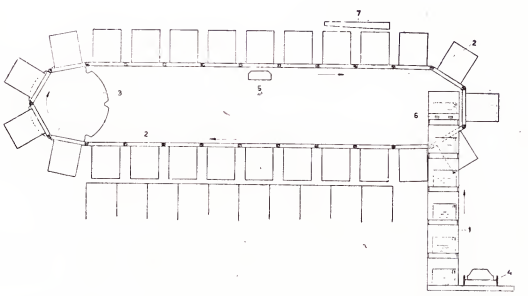


35. Special features regarding the Receptacles.

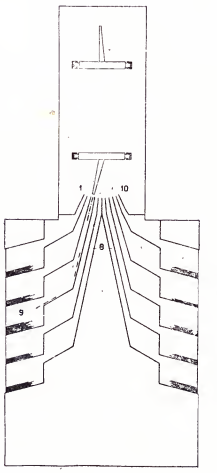
keyboard (4), depression of the appropriate combination of keys on the keyboard actuates an adjustment of the selector-bars on the carrier that is immediately passing point (5). The letter is shifted to the left and finds itself in the transport installation (1), to be brought to the ejection device (6). The instant that the carrier passes point (6), the ejection device quickly shoots the letter into the letter-holder of the carrier (2), the carrier having already passed the inclination device (7) which gave its letter-holder the required inclination determined by the adjustment of the selector-bars.

The letter-holders are capable of 5 different inclinations to the left and 5 to the right.

After having passed the ejection device, the carrier arrives on top of the aluminium chutes (8). Here, under the carrier, lies a row of 10 oblong openings, corresponding to the 10 inclinations in which the letter-holders of carriers can be adjusted (fig. 37).



36. Diagram showing the operation of the Transorma Sorting Machine Type A 1/100.



37. Cross section of the Transorma Sorting Machine Type A 1/100.

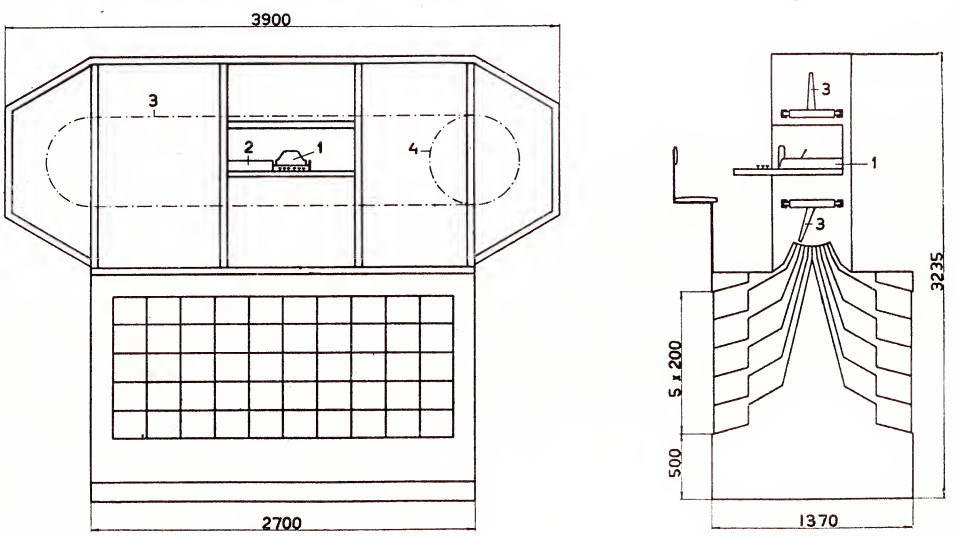
The 10 oblong openings extend over the entire length of the machine, but are divided by cross partitions into 10 sections lying one behind the other. The drawing gives a cross-section of one of these sections. At the top, the row of 10 *adjacent* openings (1-10) is to be seen.

Under these openings stand the aluminium chutes (8) leading down to the receptacles, 5 to the left and 5 to the right. The 10 inclinations

which can be assumed by the letter-holders of the carriers correspond to the positions of the 10 oblong openings immediately under the carriers. When at this point the bottom of a carrier opens, the article dropped passes through one of the aluminium chutes (8) into the receptacle to which it leads (9).

By placing 10 of these sections behind each other, 10 x 10, i.e., 100 discharge guides, aluminium chutes and receptacles are obtained. It is essential that the bottom of each carrier should open exactly over the right section or discharge guide. For this purpose, above the carrier track a discharge device has been installed for each section. The setting given the selector-bars on the carrier causes its bottom valves to open suddenly just above one of the 10 discharge guides, and lands the article into one of the aluminium chutes.

The carrier, now emptied of its contents, is then carried back by the drive into the lower region of the track, where the letter-holder is swung back into its vertical (neutral) position, the bottom valves being closed and the selector-bars readjusted into their original position, whereafter it is ready to start off again on its journey over the track. In this machine the endless chain is formed by 18 carriers, each of which is exactly alike, though it operates independently of the other.



38. Diagram of the Transorma Sorting Machine Type A 1/100 with shortened base.

The Transorma A 1/100 with shortened base.

A variation of the above described Transorma A 1/100 is a machine of the same capacity, viz., with 1 keyboard and 100 receptacles, but so adapted as to occupy considerably less floor space. The compacter form of the machine is obtained by transferring the Transormist's seat from the ground level to a balcony situated over the receptacles (fig.38).

The keyboard with supply-channel is here indicated by (1). At point (2) the letters are conveyed to the left to reach the ejection device. Here again, the endless chain (3) is composed of carriers of the above described construction, driven by the chain wheel (4). The aluminium chutes and receptacles are exactly similar to those in the normal type of machine A 1/100.

The Transorma Sorting Machine A 5/300.

This machine, which as the letter A denotes, is used to sort both incoming and outgoing mail, consists of the following parts (fig. 39):

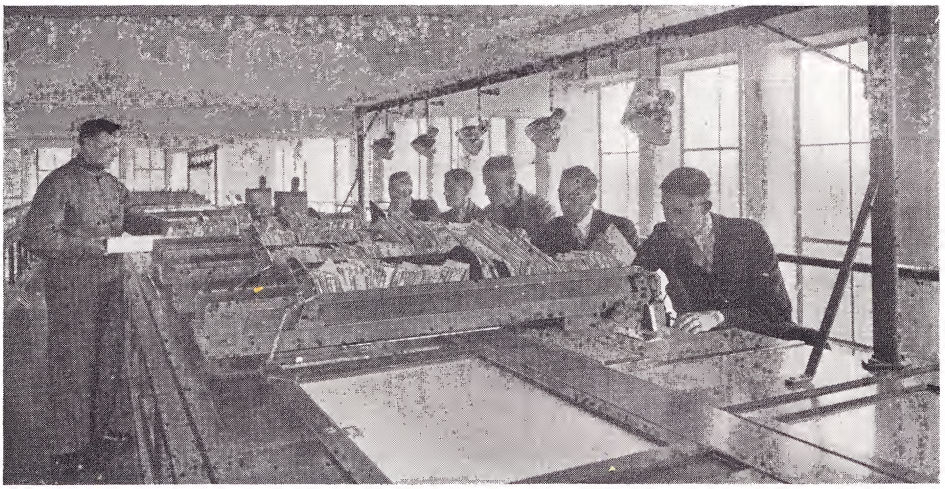
a. 5 keyboards (4),
b. a transport mechanism (5-6),
c. a driving installation,
d. 300 receptacles (9).

The keyboard, track and drive are in the top of the machine; thereunder, separated from the upper part by a floor, are the receptacles. On this floor (hereafter referred to as the "balcony"), are the seats of the Transormists operating the keyboards. This type of machine, having 5 keyboards, can sort 15,000 articles per hour.

The Keyboards.

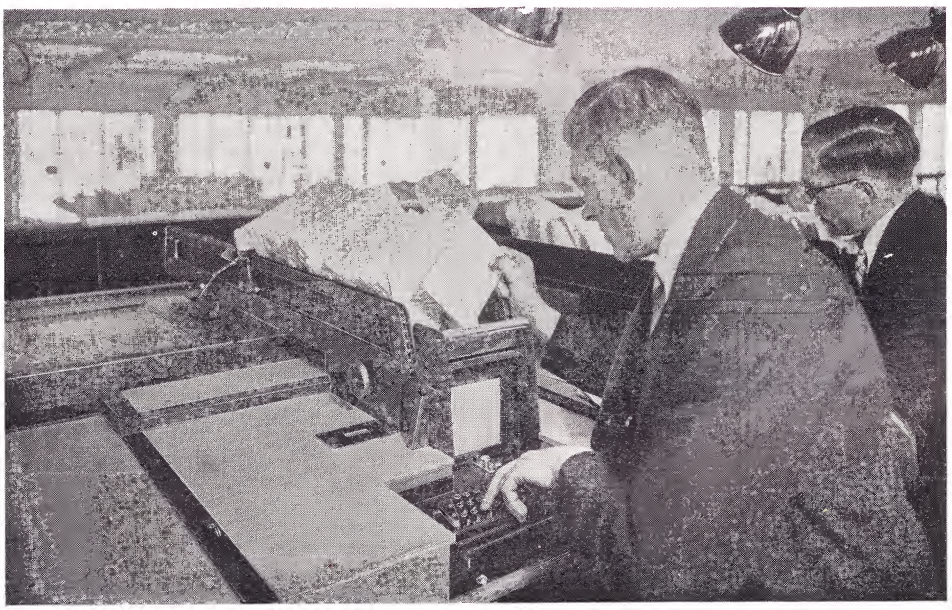
The articles to be sorted are placed in aluminium trays which are transported by means of a belt-conveyor to the side of the balcony facing the seated Transormists. The trays are removed from the belt, and their contents emptied into the supply-troughs at the side of the keyboards. As the trays fit exactly into the troughs and one of their narrow sides can be opened, this emptying can be very simply and quickly effected.

Fig. 40 shows the supply-troughs in front of which five Transormists are seated at work. On the left a tray is being emptied. The empty trays



40. Feeding fresh supplies of mail (Transorma Type A 5/300).

41. The Keyboard with Slot.



are sent back on the returning belt of the conveyor to the stamp cancelling machine or facing table. The emptying occurs without any interruption of the Transormist's work at the keyboard.

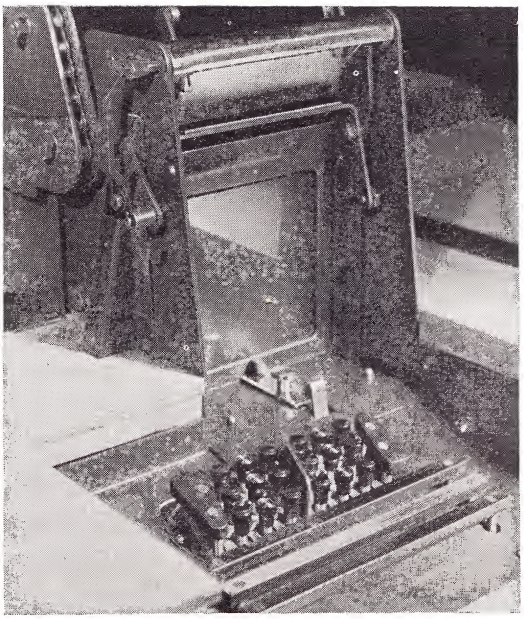
The supply-trough is fitted with a device to ensure that the letters are brought to the forefront of the trough. Immediately in front of this trough is the slot into which the letters are dropped, it being regularly opened and closed by a valve fifty times a minute. The Transormist only needs to make a slight movement with the wrist of his right arm to take the foremost letter and drop it into the slot. The elbow of his right arm rests on a cushion. As he drops the letter into the slot, he reads the address, and with his left hand depresses the necessary combination of keys to ensure that it will arrive in the receptacle to which the letter must be transported.

The keyboard contains 9 keys for the units and 9 for the tens. The hundreds are obtained by depressing oblong shaped keys, of which the machine now being described has 3 (fig. 31).

Besides the keys for the units and tens, there is a resetting key for cancelling a previous setting should this be in error. When this key is depressed, the letter in question is discharged in a "sundries" receptacle set aside for miscellaneous letters, which also contains letters dropped into the slot without any key having been depressed, as in the case of illegible or incomplete addresses.

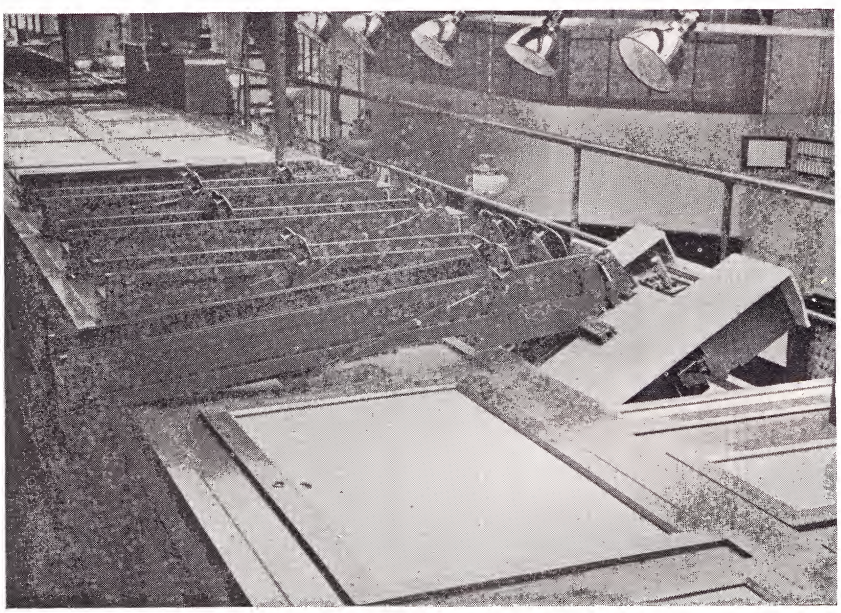
Figs. 41 and 42 show the keyboards, which are so arranged that they can be operated "blind" and with one hand. This enables the Transormist to devote all his attention to the addresses on the letters and renders it needless for him to look at the keys.

The photographs also show a key which the Transormist has to place in the keyboard before he can begin his work. Besides serving to unlock the keyboard, it has another function, for it contains a mark which is different for each Transormist. The keyboard has a printing device which stamps the Transormist's mark on each letter passing through the slot, thus registering which of the operators is responsible for its sorting. It is also possible to use the printing device for other purposes; for instance, to indicate in which delivery the letter is to be included, or as a franking machine for stamping the postage due on the letters, etc. A counting device fitted to the side of the keyboard registers the number of articles sorted, thus automatically checking the Transormist's output. When the printing device is used for franking letters, the

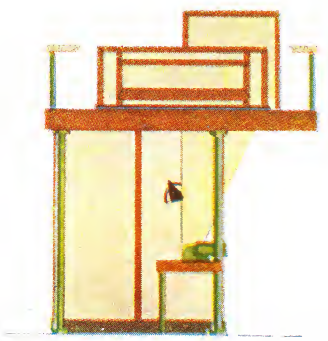


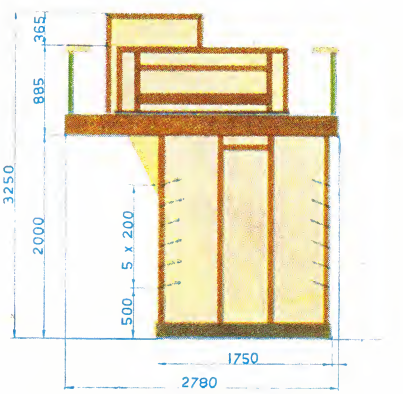
42. Photograph showing details in regard to the Keyboard and Slot.

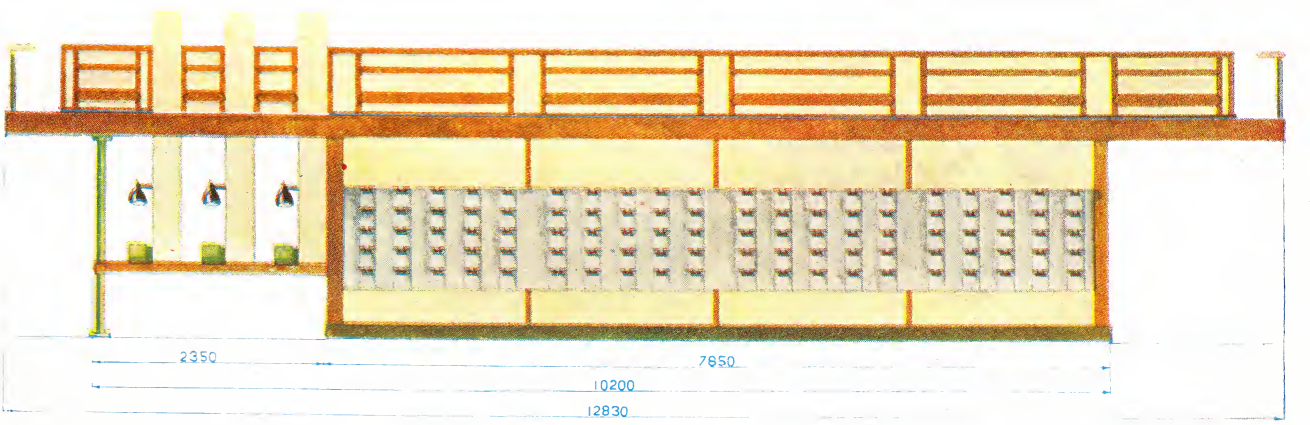
43. The Keyboard when open.



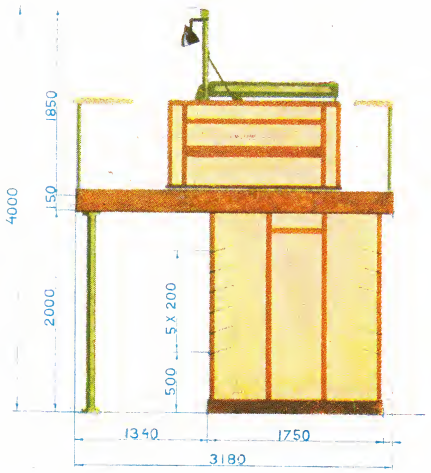
51. Transorma type A 3/200, operated from floor-level.

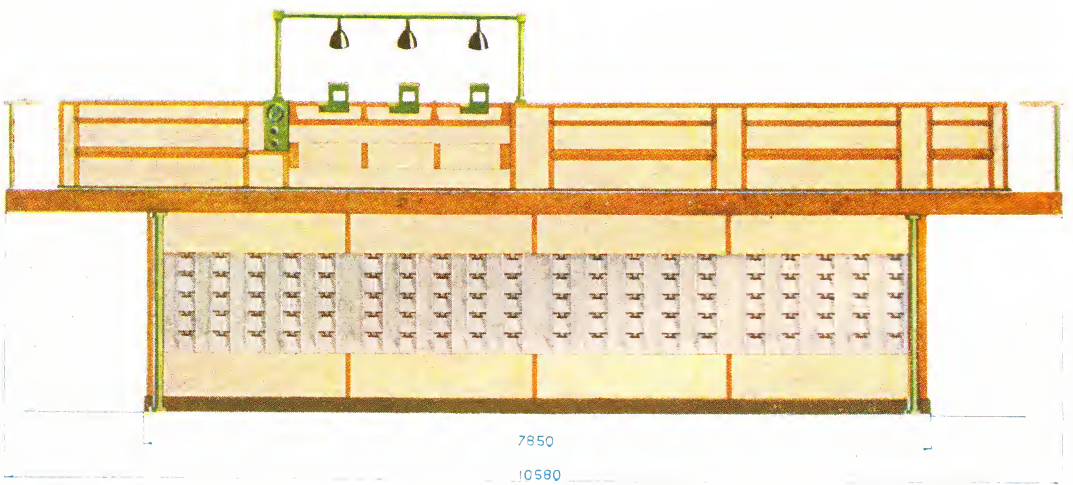






52. Transorma type A 3/200, operated from a balcony.





number of sorted, and at the same time franked, letters can be ascertained from the counter, and in that way the amount to be paid by the public can be determined quite easily, practically without causing any extra work. The counting device can be adjusted to zero by means of a key.

For purposes of inspection, cleaning and oiling, the upper sides of the keyboard are fitted with removable lids, whilst the lower section is easily accessible owing to the fact that the keyboard can be swung back on its hinges (fig. 43).

Without causing any inconvenience to colleagues sitting beside him, the Transormist can, by pushing in or pulling out a knob, put the keyboard in or out of action.

A lamp is fitted above each keyboard to ensure proper lighting for the table.

Transport Mechanism.

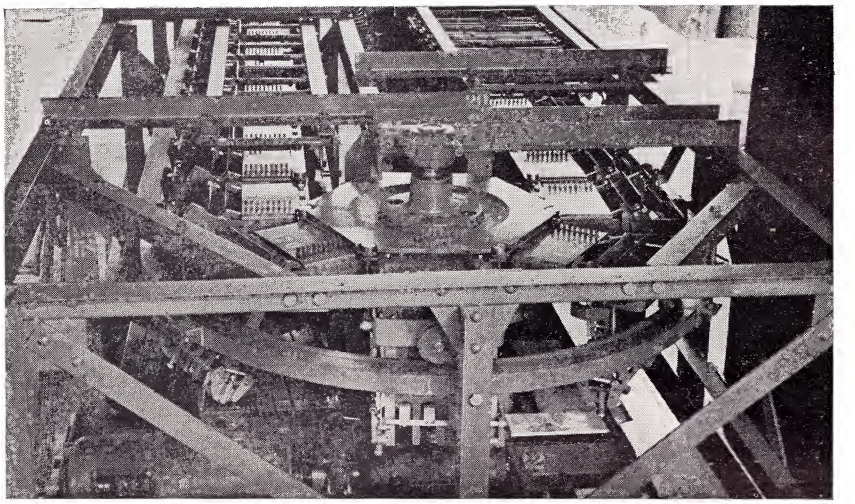
Over the balcony there is a closed horizontal rail track along which run a number of carriers linked on to one another to form an endless chain. These carriers convey the letters to the receptacles determined by the combination of keys depressed. Each carrier only conveys one letter during one circuit of the endless chain, after which it is ready to receive another for delivery at some other point of its track.

To render it possible for each carrier to eject its contents into one of the 300 different receptacles, it is provided with a narrow box, suspended vertically, which is called the letter-holder. This can swing round an imaginary horizontal axis running parallel with the rail track. By means of a pawl engaging with a toothed quadrant, the holder can be held in 10 different inclinations.

The top of the carrier is open; the bottom is kept closed by two valves under spring tension. The valves are provided with blade springs of such a shape that when the valves are opened by downward pressure on a pawl, the article lying at the bottom is shot downwards out of the carrier with great force.

Thus the carriers are so constructed that they can perform two important functions:

1. Each letter-holder of a carrier can be held in 10 different inclinations, thus enabling sorting to be effected *at right angles* to the track.
2. On the bottom valves being opened, the letter is ejected from the bottom of the carrier and, as in the present case the carrier



44. Driving mechanism of the Carriers.

45. The numbering and labelling of Receptacles.

successively passes over 30 sections of receptacles, sorting can also be effected *in the direction* of movement.

This is possible because the carriers are provided with a number of adjustable selector-bars. On a certain combination of keys being depressed on the keyboard, a corresponding setting is given to these selector-bars on the carrier to determine the inclination to be given to the letter-holder, and exactly where the bottom valves must open.

The Driving Mechanism.

As shown by fig. 44, the endless chain is driven in one of the bends by a large horizontal chain wheel provided with slots to grip the chain. The wheel itself is driven by an electric motor of $1\frac{1}{2}$ H.P. The machine must be capable of handling 3,000 letters and other articles per hour per keyboard. As there are 5 keyboards, 15,000 letters, etc., have to be transported per hour, which means that a carrier with its letter-holder passes along any selected point on the rail track 15,000 times per hour. By regulating resistance in the current circuit of the motor it is possible to reduce this speed of 15,000 per hour, as may be necessary when the machine is used for training purposes, or if the rate of sorting 3,000 articles per hour is deemed too high for beginners.

The driving chain wheel is provided with a brake band, which brings the chain to an immediate standstill when the current is switched off. In the track there are a number of safety devices which automatically switch off the supply of current to the motor should a carrier not function properly owing to inexpert handling. The machine is then brought to a standstill, light signals indicating which safety devices have been brought into action. In this way the cause of the trouble is immediately localized and consequent delay minimized.

The Receptacles.

The articles shot out by the carriers land in the receptacles via aluminium chutes. During their passage through these, there is a certain point at which the falling letter changes its upright to an almost horizontal position. To prevent the articles assuming a vertical position owing to the speed at which they are landed in the receptacles, these are provided with a celluloid plate. As a receptacle gets filled, this plate rises until it touches a button overhead, which operates a safety device that switches on a lamp beside the receptacle in question, thus indicating that it is

full. A central signal lamp for each wall of receptacles is likewise switched on as soon as one of the 150 receptacles of that wall is full. The front of each receptacle is closed by means of two hinged bars of stainless steel, bearing a plate on which the number and place-name of destination can be shown (fig. 45).

Beside each of the receptacles there is a holder for bundle labels. In the bottom section lying between the two bars there is an opening which facilitates emptying (fig. 46).

Letters, etc., for the same destination, but worked from different keyboards, are automatically deposited in the same receptacle.

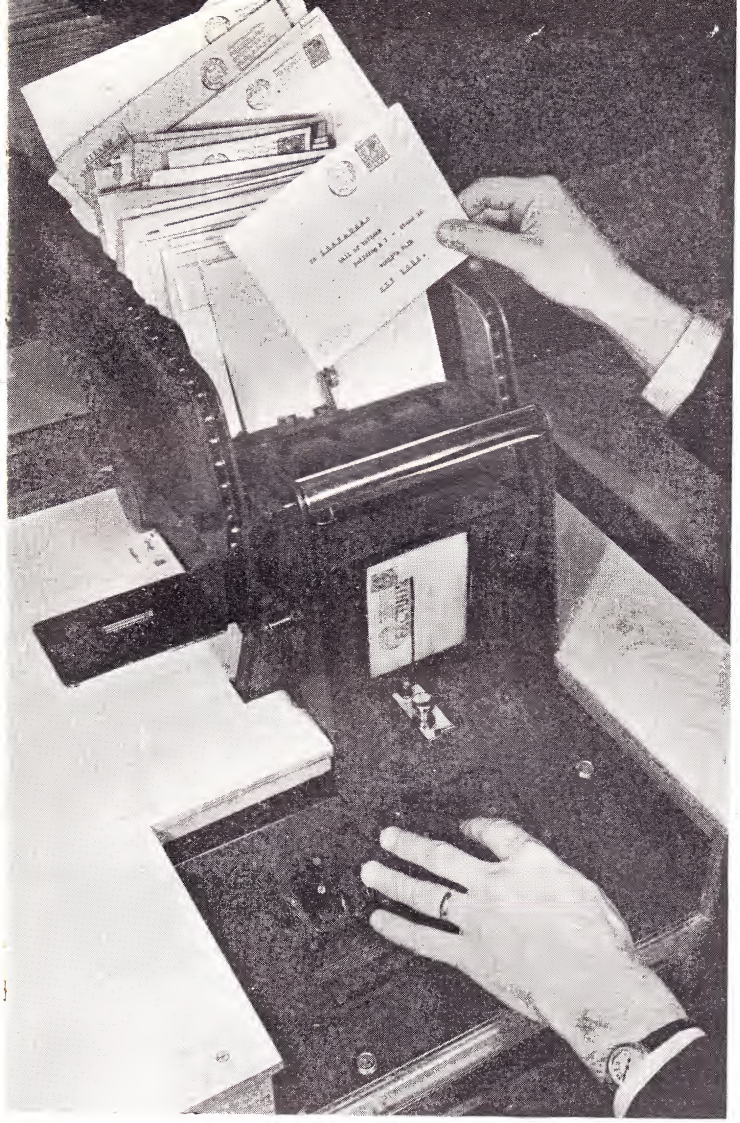
The upper four receptacles of each vertical row are 20 cm (abt. 8 in.) deep; the lower receptacles have a springed bottom which sinks according to the weight of articles deposited in them. These receptacles are therefore specially suitable to hold mail for large towns, or in case the machine is used for the sorting of deliveries, mail destined for addressees with heavy correspondence.

Operation of the Sorting Installation.

Fig. 47 is a diagram to illustrate the working of the Transorma Sorting Machine as seen from the top, and fig. 48 a cross-section through the keyboards. (1) is the endless chain of carriers; (2) one of the carriers in that chain; the driving sprocket wheel which sets the chain in motion is to be seen at (3); the letter-holders proper are indicated by the number (4), and are also clearly shown on the cross-sectional diagram, fig. 48.

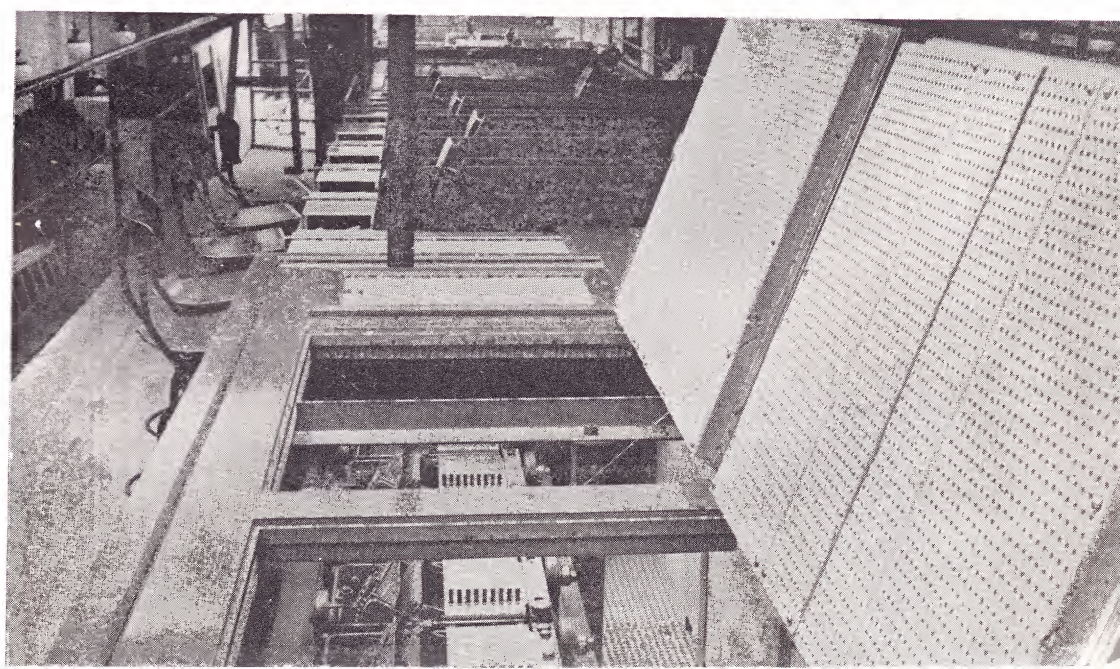
The chain of carriers runs at a fixed speed under the keyboards (5). Here the letter-holders are shown in a vertical position with their bottom valves closed. From the keyboard on the extreme left a letter is dropped into the slot, the entrance valve is open and the letter falls on a second or bottom valve (see fig. 48). The letter can be seen through a window, as shown in fig. 49.

As a letter is being dropped into the slot, a combination of keys is depressed. At the moment carrier no. 1 — the number of carriers in this machine exceeds 80 — arrives under keyboard 1, the entrance valve is closed, the letter is stamped with the Transormist's mark and counted. The instant the carrier is exactly under the bottom valve of the keyboard, this valve opens, rollers rotating at a high speed seize the letter and shoot it into the letter-holder of carrier no. 1. The depression of a combination of keys gives a certain setting to a number of selector-bars on carrier no. 1.



49. The Keyboard with Slot.

50. Two shutters when open.



The Transormist at keyboard no. 2 has also dropped a letter into the slot, and it has landed in carrier no. 2; an article from keyboard no. 3 in carrier no. 3, and so on. Meanwhile, the bottom valve of keyboard no. 1 has closed and remains so until carriers nos. 2, 3, 4 and 5 have passed, reopening as soon as carrier no. 6 is under keyboard no. 1. Thus, five carriers pass under keyboard no. 1 in the interval that elapses between the insertion of two letters into the slot. In this way keyboard no. 1 always co-operates with carriers nos. 1, 6, 11, 16, etc.; keyboard no. 2 with carriers nos. 2, 7, 12, 17, etc. This implies that it is quite impossible for articles from different keyboards to be deposited in the same carrier; for once the proper adjustment has been made between keyboards and carriers, the bottom valves always open at the right moment.

Farther along their course, at point (6) (fig. 47), the carriers arrive over the inclination device which, by setting the selector-bars, causes the right inclination to be given to each letter-holder. The carriers then arrive on top of the aluminium chutes (7) (fig. 48). These 10 oblong openings lie side by side under the carriers and correspond to the 10 different inclinations that can be given to the letter-holders of the carriers. They run over the entire length of the machine, but are divided by cross-partitions into 30 sections, one behind the other. One of these is to be seen on fig. 48 showing the cross-sectional diagram of the machine. Above them are the 10 adjacent openings from which aluminium chutes run down to the back of the receptacles, five to the right and five to the left. When the letter-holder opens above a chute, the article shot out passes through one of the chutes into the receptacle to which it leads. Owing to there being 30 sections, one behind the other, the total number of receptacles in the machine is 300.

Above the carrier track there is a discharge device for each section. Dependent on the setting given to the selector-bars of the carrier, its bottom valves open over one of the 30 sections, and the letter lands in one of the aluminium chutes.

After the carrier has discharged its contents, it arrives, via the right hand bend, over the resetting device (8 and 9) (fig. 47), so that the letterholder returns under the keyboard in its vertical position. Here the setting is removed from the selector-bars and the bottom valves are closed, after which the carrier is ready to start out on a fresh round.

The machine has a wooden encasement with shutters at various points to make it possible to reach any spot in the interior without

difficulty. Fig. 50 gives a view of two shutters that have been opened. The encasement and shutters are lined with plates of celotex to ensure the practically noiseless running of the machine.

Operation from floor-level.

This type of sorting machine in which the chain of carriers runs along a horizontal track, can also be supplied with the Transormists' seats placed on the floor, as described on page 93 for type A 1/100.

In that case a vertical transport device carries the articles from the keyboards to the horizontal chain of carriers. These machines are pre-eminently suitable for use in rooms with low ceilings. In offices with a limited traffic it may be preferable, with a view to the division of work, to place the keyboards on the floor, in spite of the fact that such machines occupy somewhat more floor space. To enable the reader to compare the two types, there are given two drawings: the first of a machine with 3 keyboards and 200 receptacles, operated from floor-level (fig. 51), and the second, of a machine likewise with 3 keyboards and 200 receptacles, with the Transormists' seats on a balcony (fig. 52).

The Transorma A 30/300 and B 30/300.

The Transorma A 30/300 is a sorting machine intended for offices with very heavy traffic. Type A is suitable for the sorting of both incoming as well as outgoing mail. As each keyboard can handle 3,000 articles per hour, 30 x 3,000 = 90,000 articles can be sorted per hour into 300 different receptacles

The maximum dimensions of articles that can be dealt with by this machine are: length 250 mm, breadth 175 mm, thickness 8 mm (i.e., approximately 10 in., 7 in. and $^1/_3$ in. respectively), just as in the case of the other types of sorting machines already described.

Type B machine is specially suitable for sorting thin forms, such as postal-cheque and money-transfer forms. Apart from minor details and differences in measurements, the construction and working of the A and B types are the same, so that what is said hereunder holds good for both types.

The machine consists of:

a. 30 keyboards,
b. a transportmechanism,
c. a driving installation,
d. 300 receptacles.

The Keyboards.

The articles to be sorted are placed in aluminium trays and transported by means of a belt-conveyor to the side of the balcony facing the Transormists. The trays are taken from the conveyor and the contents emptied into the supply-troughs alongside the keyboards. As the trays fit exactly into the troughs and one of their narrow sides can be opened, this emptying can be done very simply and quickly. The empty tray is sent back on the returning belt of the transport mechanism to the stamp cancelling machine or the facing table. The emptying is done without causing any interference to the work of the Transormist at the keyboard.

The supply-trough is provided with a device ensuring that the postal articles are always brought to the forefront of the trough. Just in front of this trough is the slot into which the articles are dropped, which is regularly opened and closed by a valve fifty times a minute. The Transormist takes the foremost letter with his right hand, reads the address and drops it into the slot, at the same time depressing with his left hand a combination of keys on the keyboard corresponding to the number of the receptacle to which the letter is to be conveyed. The first two manipulations require only a slight movement of the right wrist; the right arm is supported on a cushion.

The keyboard contains 9 keys for the units and 9 for the tens. The hundreds are obtained by depressing oblong shaped keys of which this machine has 3. In addition, there is a resetting key which serves to correct a faulty depression on the keyboard. When this key is depressed, the articles in question are collected in a "sundries" receptacle reserved for miscellaneous articles, wherein are also found the articles dropped into the slot without the depression of any keys, as when an address is illegible or incomplete.

The arrangement of the keyboard is such that it can be operated "blind" and with one hand. This enables the Transormist to devote his full attention to the addresses on the letters and makes it unnecessary for him to look at the keys.

Each Transormist has his own special key which has to be placed in the keyboard before he can begin his work. Besides serving to unlock the keyboard, it has another function, for it contains a mark which is different for each Transormist. The keyboard has a printing device which stamps the Transormist's mark on each article passing through

the slot, thus registering which of the Transormists is responsible for its sorting. It is also possible to use this printing device for other purposes, for instance, for marking letters to indicate in which round they are to be included, or as a franking machine by stamping on the letters, etc., the postage due, and so on.

A counting device at the side of the keyboard registers the number of articles sorted, thus automatically checking the Transormist's output. When the printing device is used for franking the letters, the number of articles sorted and franked and the amount to be paid by the public can be determined quite simply, practically without causing any extra work. The counting device can be adjusted to zero by means of a key.

For purposes of inspection, cleaning and oiling the keyboard, its upper sides are provided with removable lids, while the lower section is easily accessible owing to the fact that the keyboard can be turned back on its hinges.

Independently of his colleagues seated beside him, the Transormist can, by pushing in or pulling out a knob, put the keyboard in or out of action. A lamp is fitted above each keyboard ensuring proper lighting for the table.

The Transport Mechanism.

Above the balcony there is a closed horizontal rail track along which run a number of carriers coupled on to one another to form an endless chain. These carriers convey the articles to the receptacles determined by the combination of the keys depressed. The carriers contain narrow letter-holders, which hang vertically, are open at the top, and have hinged valves at the bottom. Downward pressure on a pawl opens these valves, ejecting the article from the holder. Each carrier conveys only one article per round of the endless chain, whereafter it is ready to carry another article for delivery at some other point along the track.

On the bottom valves of the carrier being opened, the letter is ejected into one of the oblong top-openings of the aluminium chutes. Each carrier is provided with a number of adjustable selector-bars. When a certain combination of keys is depressed on the keyboard, a corresponding setting is given to these selector-bars determining exactly where the letter-holder is to eject the letter.

The Driving Mechanism.

In the bends, the endless chain is driven by horizontal chain wheels containing slots to grasp the chain. By regulating resistance in the current circuit of the electric motor, it is possible to reduce the speed of 3,000 articles per hour per keyboard, as may be necessary when the machine is used for training purposes, or if the rate of 3,000 articles per hour is deemed too high for beginners.

The driving wheels are provided with brake bands which, when the current is switched off, quickly bring the chain to a standstill. A number of safety devices in the track automatically switch off the supply of current to the motor should a carrier not function properly owing to inexpert handling. The machine is then stopped at once, light signals showing which safety device has come into action, so that the locality and cause of the trouble can be immediately detected.

The Receptacles.

In these machines the receptacles are placed side by side in the two longer walls and stand about 70 cm (2 ft. 4 in.) above ground level. In the vicinity of the keyboards, on the side where the Transormists are seated, there are no receptacles. Letters, etc., for the same destination, though operated from different keyboards, are automatically deposited in the same receptacle. Consequently, there is a considerable flow of letters to each receptacle, so that when receptacles are emptied fair-sized bundles are always obtained.

Special devices in the receptacles ensure proper stacking of the letters. Moreover, they are provided with a sagging bottom, so that they can hold large quantities without it being necessary to empty them frequently.

Operation of the Sorting Installation.

Fig. 53 shows the endless chain at (1), the driving wheels at (2). The transport mechanism (3) runs behind the keyboards (4). The chain of carriers passes at a fixed speed under these keyboards; the bottom valves of the letter-holders in the carriers are closed. The Transormist seated at his keyboard drops a postal article into the slot; it lands on the bottom valve. At the same time as the letter is being dropped into the slot, a combination of keys is depressed. Just before a carrier arrives under the keyboard, the slot is closed, the letter is stamped with the Transormist's identity mark, and is counted.

Just at the moment when the right carrier is under the keyboard, the bottom valve opens, rollers rotating at a high speed grip the article and shoot it into the letter-holder of the carrier. Moreover, in accordance with the keys depressed, a certain setting is given to selector-bars on the carrier.

All the keyboards function in the same way and can be worked independently of each other. Therefore it is not necessary for all keyboards to be operated together; at times when there is little traffic, only a limited number of keyboards need be worked.

After having passed under the keyboards, the carriers arrive above the receptacles (5), and it is important that the bottom valves of their letter-holders should open at the right spot. To this end, each receptacle is provided with a discharge device above the carrier track. According to the setting given to the selector-bars of the carrier, its bottom valves are flung open over one of the 300 receptacles and then the article lands in the desired receptacle.

The machine is provided with a wooden encasement containing shutters at various points to make it possible to reach any spot in the interior without difficulty. Celotex plates inside the machine ensure practically noiseless running.

The C Type Installation.

As regards the construction of the various parts, this type is in many respects similar to types A and B. However, a special point of difference is that the various parts are set up at different points of the complex of buildings for which the installation is intended. Fig. 54 gives some idea of how such a machine might be installed in a certain complex of buildings.

The TRANSORMA BUNDLING AND SEALING MACHINE.

As mentioned in Chapter 3, after the introduction of mechanical sorting, the time required for bundling postal articles was out of proportion to the time needed for sorting and the necessity of mechanizing this part of dispatch work was keenly felt.

This demand was met by the invention of the Transorma Bundling and Sealing Machine "B.S.M.", manufactured, like the Transorma Sorting Machines, by Werkspoor Ltd., Amsterdam.

As regards the practical utility of this machine, the primary requirement was that it should be possible to effect bundling mechanically far more rapidly than when bundling by hand and moreover, that the machine should be able to tie up all bundles — which vary considerably in size — without its being necessary to adjust it for each separate bundle. Such an adjustment, adapted to the size of every bundle, would greatly handicap speed and a machine constructed on that principle would have to be condemned forthright.

The designers of the Bundling and Sealing Machine have succeeded in producing a machine which does not require separate adjustment for each bundle. Moreover, its operation is very simple, this being a factor not to be underestimated in Dispatch Offices, where large numbers of people are employed.

Anyone can immediately operate the machine without previous training.

There are two main types of machine: one for tying up bundles the maximum dimensions of which are breadth 25 cm (10 in.), height 18 cm (7 in.); and a larger type for bundles up to 35 cm (14 in.) in breadth and 22 cm (9 in.) in height. For both types there is no restriction on the length of the bundles.

Besides being used to tie up bundles of mail, the machines are also suitable for sealing boxes and other packing material. Consequently, they are of great practical value to private enterprises such as printing offices, textile mills and in short, all those industries in which there is a great deal of packing to be done. Government services other than the Post can also use the Bundling and Sealing Machine to advantage. In this connection we may mention the Inland Revenue and the Customs Departments, where after their contents have been examined, parcels must be quickly and efficiently closed again.

With both types of Bundling and Sealing Machines it is possible to fasten the bundles, boxes or parcels in such a way that they are at the same time sealed; the metal seal can then be provided with an inscription.

As already stated, the operation of the Transorma Bundling and Sealing Machine is very simple. Figs. 55-59 explain the mode of operation and give directions for use; while figs. 60-67 show how the string and iron band are placed in the machine.

The pile of letters or other articles to be bundled is placed on the table of the machine against a wall which forms part of an arc-chaped

Instructions for use of the Bundling and Sealing Machine "B.S.M."

55. Switch on the motor.
Press the pile to be bundled against the bundling wall .... *gently* press the pedal *once*.... and the "B.S.M." bundles.
Take the bundle out on the left and let the pedal rise again *gently*.

56. *Big equal piles* are placed *flat* on the bundling table and pressed *against* the bundling wall.

57. *Unequal* piles are pressed firmly against the bundling wall, after having placed *the larger sizes underneath*, bent round the smaller.

58. *Small* quantities should be *lifted slightly* in front and pressed against the bundling wall or....

59. .... Move the adjustable arm of the slideclamp to the width of the largest size so as to check the pull of the string.

N.B. If no string fastening has been formed, first remove the metal seal that may be present, before continuing to bundle.

55

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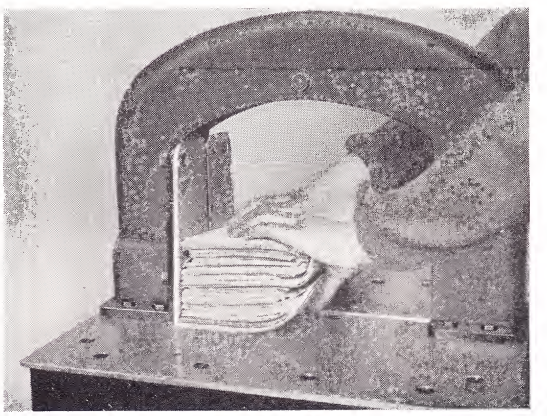

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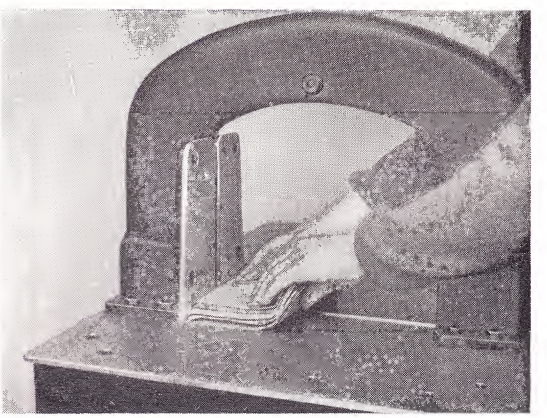

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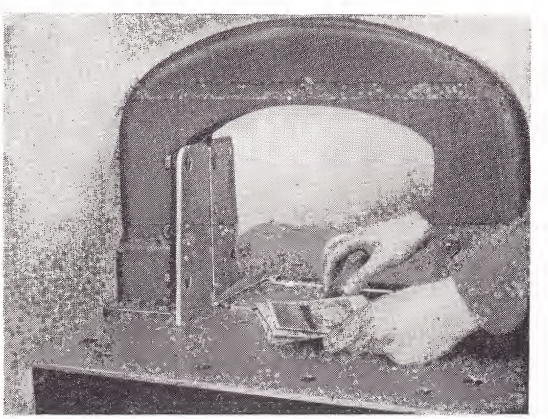

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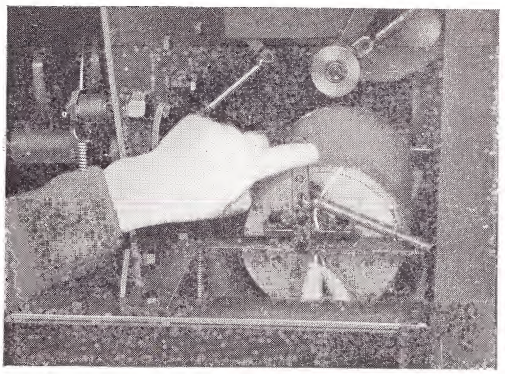

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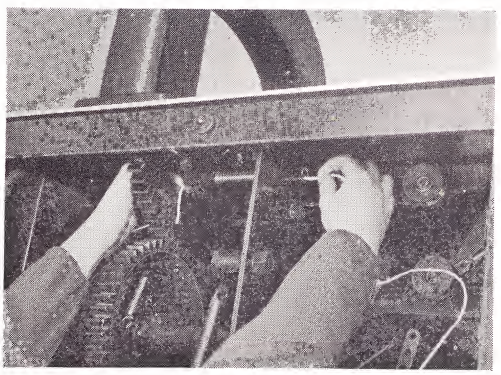

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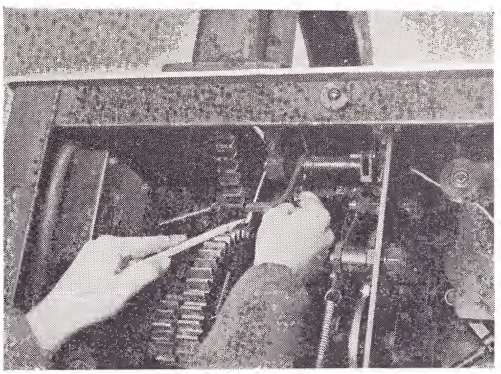

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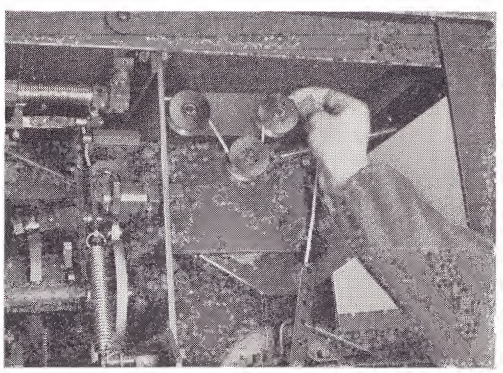

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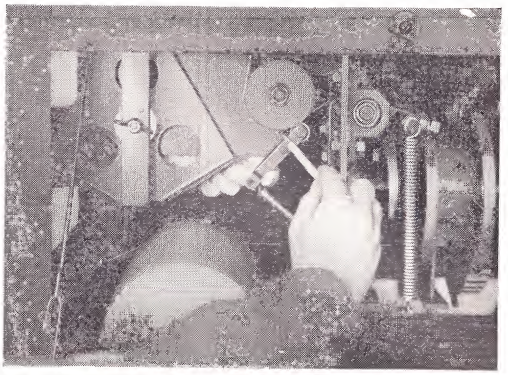

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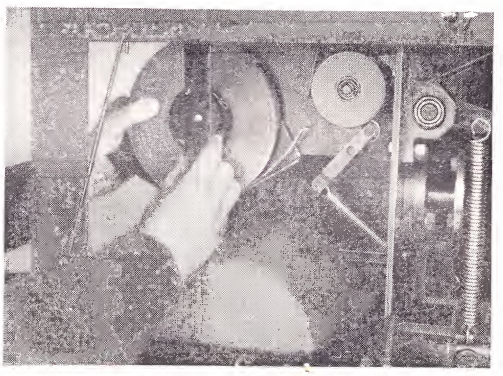

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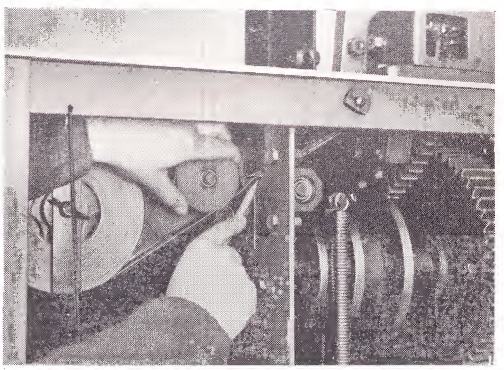

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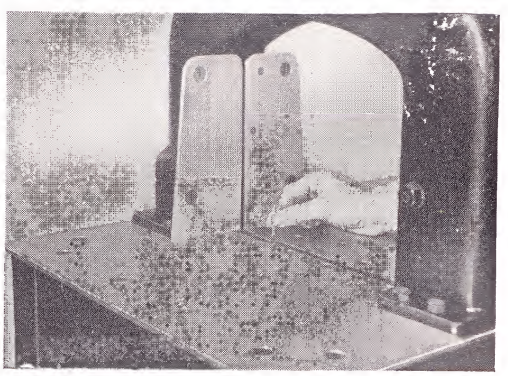


The use of String and Metal Band.

String.

60. Pull straining lever to the left and pass the end of the string through the opening. Then.....
61. ....pass the string through the hollow shaft of the string-catcher. Then....
62. ....fasten it into the string-catcher drawn towards the worker. And....
63. ....pass as indicated over the stretching-pulleys.

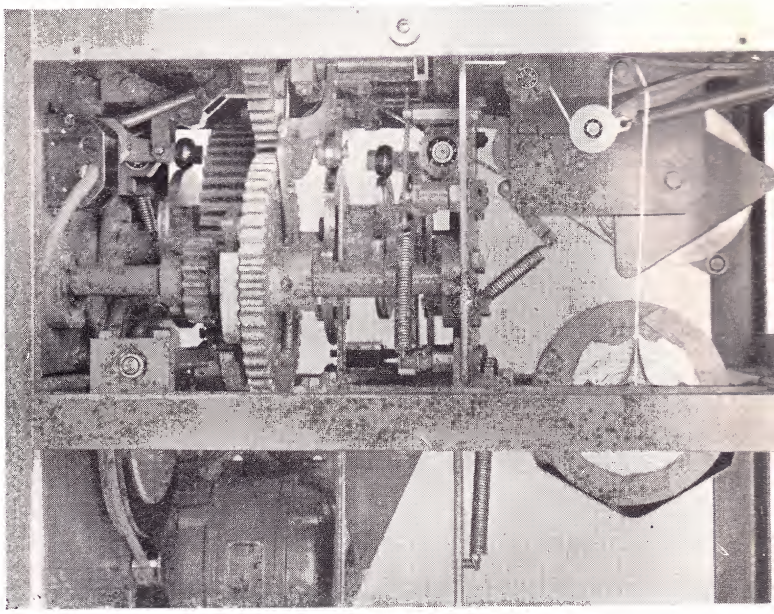
N.B. Remove knots or loops in the string!

Metal Band.

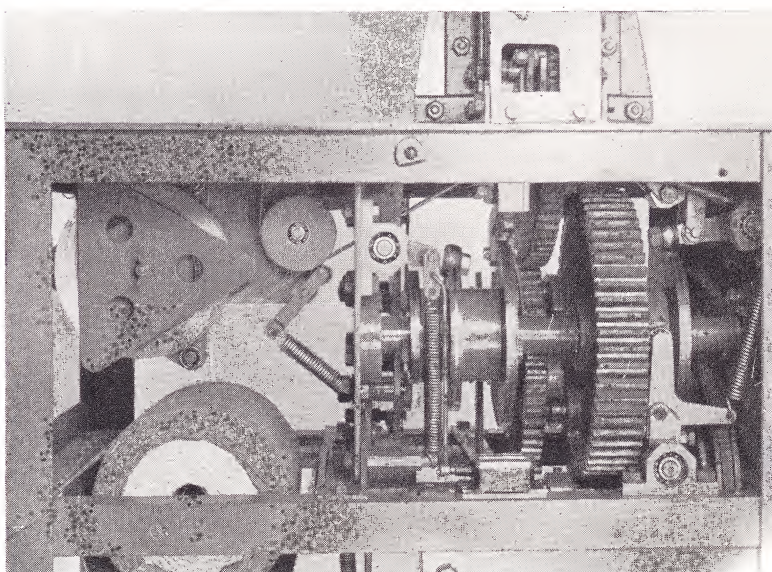
64. Lift lever a little and remove the remainder. Then....
65. ....insert the new roll of band-iron. Then....
66. ....put the end of the band-iron between the shifting-up roller and pass it into the guidepipe. And....
67. ....turn it on until it stops against a match put into the controlling hole.

N.B. Avoid bending or kinking of the band-iron!

68. Photo of the mechanism of the "B.S.M."



69 Photo of the mechanism of the "B.S.M."



case extending over the table. This case contains the principal part of the machine, an intermittently driven, rotating "driving ring". This ring, for which special openings have been made in the table to enable it to work its way thereunder, has a toothed periphery and is driven in one direction from the main shaft by means of a gear-wheel. The ring serves to wind the string around the bundle.

The string is wound off from a reel which, as can be seen from figs. 68 and 69, is mounted on one side of the machine under the frame. From the reel, via a supply device, the string runs over tension pulleys and then in the direction of the driving ring, the loose end being fastened by spring tension to a movable string-catching device, situated close to the ring.

This device is constructed in such a way that the string can only be pulled through in the direction of the ring, reverse movement not being possible.

The end of the string held by this string-catcher lies in the track of the ring. As soon as the machine is put into motion, the ring, by means of a gripping device, seizes the end of the string, pulls it out of the string-catcher and upon rotating further, loops the string,which runs through a slot in the top of the table, round the bundle.

At a certain moment, just before the winding round is completed, the string, which is being pulled out, is recaptured by the string-catcher and fastened, whilst the ring with the end of the string connected to it moves on a little.

In this way, the string wound round the bundle is tightened as in the case of bundling by hand. The ring is then stopped, but the main driving shaft continues its motion. The string round the bundle is kept taut by the ring now brought to a standstill. Meanwhile, other parts of the machine, brought into motion by the revolving driving shaft firmly fasten the two ends of the string lying close together by means of a seal cut out of a metal band. The last thing the machine does is to cutt off the string behind the metal seal, whereafter the bundle, which is now ready, can be removed from the table.

The metal band out of which the seals are cut, is drawn from a roll placed (as clearly shown in figs. 68 and 69) over the reel for the string. By a transmission from the driving shaft this band is unrolled a little during the movement of the driving ring, so that the end of the metal band is placed under the pile of letters to be bundled. Next the driving

54. The Transorma Sorting Machine Type C.

ring, which makes 1½ revolutions, carries the string under the bundle, then over the top of it and finally, once more under it.

A piece of the metal band is now cut off by a knife. A pressing device then becomes active and rolls this little piece of band round the two ends of string lying side by side, clamping them tightly to make a secure fastening.

As binding material the cheapest kind of twine, such as sisal, can be used; other material, for instance, paper twine, is also suitable.

The fact that a great number of bundles can be made per minute is of great importance. The machine has nothing like an idle back-stroke, that is to say, there are no parts of it which have to be readjusted to their initial position after a bundle has been tied. Those parts which must be in their original position for each new operation, automatically revert to it as soon as they have performed their function during the course of bundling.

The operator of the machine has only to place whatever has to be bundled against the back wall of the arc and press the pedal down with his foot. The machine will then wind the string round the bundle in 1½ seconds.

The necessary power is supplied by a built-in electric motor of ¼ H.P.

In order to render it possible for the machine to be easily moved, it is provided with wheels, which can be locked by means of a special device.

The smaller type of machine is 68 cm (2 ft. 3 in.) in length, 45 cm (1 ft. 6 in.) broad and weighs abt. 125 kg (276 lbs). The larger type is 68 cm (2 ft. 3 in.) long, 55 cm (1 ft. 10 in.) wide and weighs about 160 kg (353 lbs.).

CHAPTER VII

THE STAFF IN A MODERNIZED POSTAL SERVICE

SOCIAL AND PHYSICAL ASPECTS

The Postal Service is extremely sensitive to fluctuations in economic conditions. In boom periods its revenues are large; in times of depression they experience a considerable setback.

In properly organized services directors very sensibly have at their disposal an advisory body which watches the economic barometer and forecasts the revenues to be expected in the near future. It does the same with regard to future expenditure so as to enable immediate steps to be taken when necessary for the extension or limitation of certain facilities to the public or personnel.

The past turbulent quarter of a century has clearly shown that in this service, where wages constitute such an important part of the total expenditure, excellent results can be obtained in a comparatively short time by sensible direction, especially by following a rational policy in matters concerning personnel, which not only includes adequate remuneration and reasonable working hours, but also the well-regulated allotment of tasks and use of the best appliances, even if this entails some immediate expenditure.

We doubt whether this is always realized, or at any rate applied. A penny wise policy has often been observed — a false economy defeating its own ends. A sluggish and dilatory official apparatus is apt to lack the necessary initiative and the direction, not having the necessary liberty of action, cannot always be cognizant of what has been attained elsewhere in the various departments of similar services. It should not be necessary for each country to invent and test every improvement for itself, as if no other country existed.

Much could be attained by regular contact and consultation between various countries. We know, of course, that there are managing bodies which now and again send a few qualified officials abroad for purposes of study and generally speaking the assistance and advice accorded them leaves no ground for complaint; but these excursions are too haphazard and insufficiently organized. In many countries too many

obstacles are put in the way of such tours to make them feasible; in some cases the permission of the whole Cabinet Council is required! Were there an international basis for permanent consultation, official objections could easily be overruled and far more effective results would be obtained with much less trouble and expense. Moreover, the postal institutions to be visited are often difficult to reach; they are sometimes situated far apart and those in charge are not always encouraging to foreign visitors. Reliable advice given in an appropriate language and sound statistics are often lacking. In most cases no arrangements whatever are made to satisfy the enquiring foreigner.

In our opinion, a centralized International Inquiry Office could render yeoman's service in this respect. An international organization of great importance — the "Union Postale Universelle" with its International Bureau at Berne — is already in existence. What would be more natural than to employ this fine institution for this purpose? This might be attained in several ways, inter alia by establishing a permanent Study-Committee, like that existing for the International Telegraph Service in the form of the C.C.I.T. (Comité Consultatif International Télégraphique).

Although not essential, the obvious place for the headquarters of this Committee would be Berne, the centre of the International Postal Service. The buildings of the International Bureau could be extended by adding assembly rooms, a library and show-rooms where furniture, machines and other technical appliances would be exhibited in operation.

As in the case of the International Telegraph Service, a permanent Study-Committee could be formed to investigate all the problems met with in the working of the postal services.

Sending missions of leading postal officials from member-states to this study centre would go far to attaining more uniformity and greater efficiency in the operation of the postal services.

This scheme could be extended by the temporary appointment of suitable officials to the postal services in countries where certain new methods have already been adopted, so as to make a thorough study of them on the spot. Numerous other suggestions could be made; the above are only intended as examples.

The use of technical appliances has in the last few decennia gained such recognition in the postal services that — just as in the case of the predominantly technical services, such as the telegraph and telephone — international consultation and exchange of ideas have become a

necessity. Here too, machines designed to replace human by mechanical energy have become indispensable.

The opinion is sometimes expressed that the substitution of mechanical for human labour is prejudicial to the interests of the staff engaged in the mechanized industry or service. This is not the case, provided the great financial benefits accruing to the service as a result of rational mechanization are partly appropriated for the improvement of the physical and social wellbeing of the employees.

Above all in an undertaking where financial results permit, the personnel has a right to expect that everything possible will be done to improve their social position and for this reason alone each member of the staff should strongly advocate mechanization whenever feasible.

An important branch of the postal service that lends itself to mechanization is sorting. Every day this involves innumerable manipulations, insignificant in themselves, but of great importance owing to their constant repetition.

The Transorma Sorting Machine does this work automatically and all that is necessary is to train the staff to operate it. This training entails no more time than that in which the same topographical knowledge is required for sorting the mail by hand into sorting cases. Chapter IV gives full particulars of this training. The numbers corresponding to the destinations of the postal articles to be sorted can very soon be memorized.

Practical experience in daily life repeatedly proves how soon frequently occurring numbers can be committed to memory. Telephone operators very quickly memorize the numbers of busy lines. In large department stores, where it is customary to refer to the articles in stock by number, it is a matter of course for employees to name an article by number. In the railway services, too, the trains are indicated by numbers with which every employee is familiar. In motorcar factories, all the parts of the cars are numbered and employees in the retail trade know the signification of each number and the number of every part.

Many examples can be given to show that this part of the Transormist's training can be brief. The rest of the knowledge required is the same as that which has to be acquired for sorting by hand. For the sorting of Postal-Cheques and Money-Transfer documents none of this memorywork is called for. The numbers are printed or written on the documents and the operating staff only has to get accustomed to the

rhythm of the machine, which soon results from practical training.

In describing the means available for the modernization of the Postal Service in the preceding chapters, the interests of users and of the service itself have been stressed. The advantages to the staff and the improved health conditions resulting from the use of better appliances have only been mentioned incidentally.

These advantages, which can be obtained from the use of better aids and appliances, better buildings, in short from the best possible equipment of the service, though less obvious are no less important.

In a well-conducted service attention is paid to the health of the staff. Prevention is always better than cure and therefore, besides the steps taken in many countries to reduce the percentage of illness amongst employees by the appointment of an attendant board of medical practitioners, it would certainly be more to the point to master the causes of ill-health in certain concerns.

When the number of cases of illness increases, an attempt can be made to ascertain whether the increase is due to influences outside the postal service or whether the causes are to be looked for in the service itself and, if so, whether they can be eliminated.

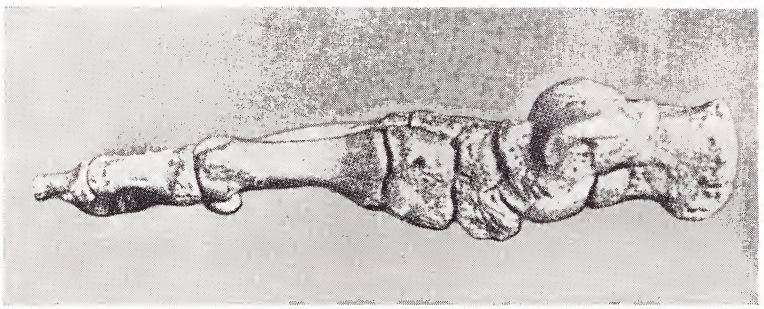
In some industries diseases occur which are inherent in the work to be performed (for instance miner's phthisis). As far as we are aware no such "occupational diseases" are prevalent in the postal service; in the long run, however, physical or mental ailments may arise, the occurrence or aggravation of which may be postponed or prevented by timely attendance to the health of the workers. The planning of buildings in which work is carried on contributes very materially towards obtaining the most favourable conditions for the health of personnel.

Combating dust.

One of the primary essentials for good work is fresh air in the work-rooms. It is therefore of importance that these should be kept as free as possible of the dust brought in by the incoming mail and bags containing it. A suction installation for this purpose cannot be regarded as an unnecessary luxury in a room where large quantities of mail are handled.

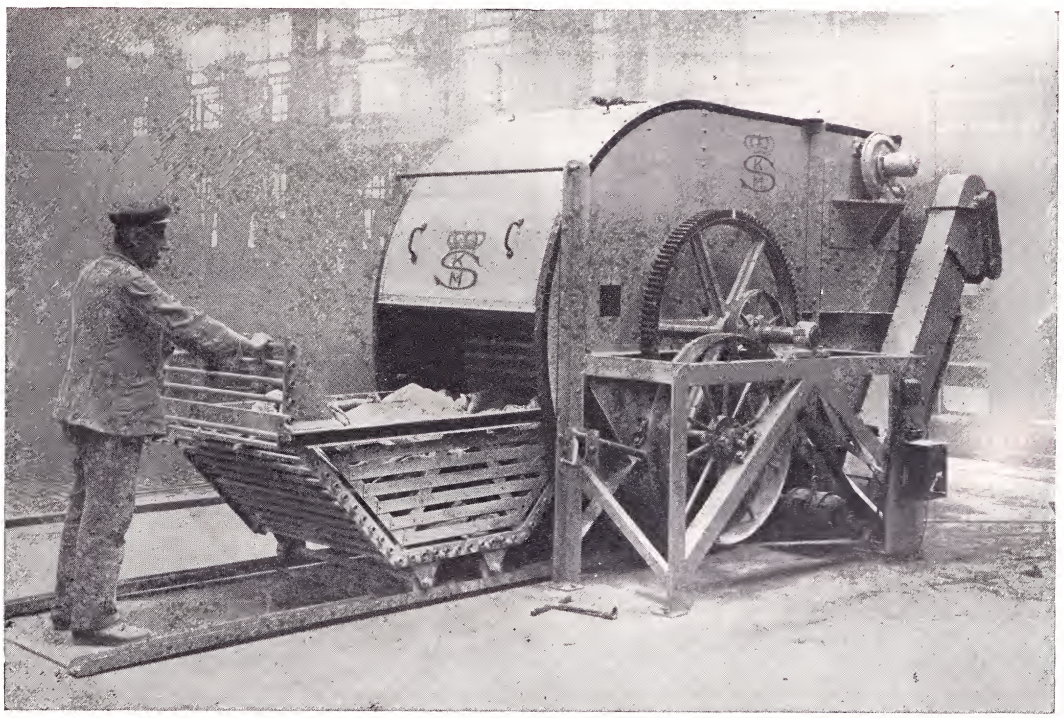
Moreover, the furniture and other equipment should be so constructed that the raising of dust is reduced to a minimum. With mechanical sorting by means of a Transorma Sorting Installation all

72. The bones of a normal foot.



72. The bones of a flat foot.

70. Machine for cleaning Mail Bags.



the dust raised is retained within the machine, which is completely enclosed, thereby causing neither discomfort nor prejudice to the health of the staff. When cleaning the machine every day this dust can very easily be removed with a vacuum cleaner.

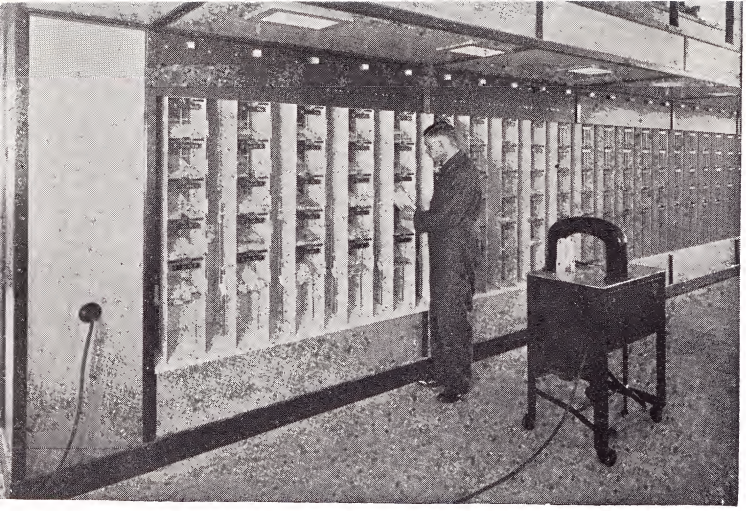
Attention should also be paid to the cleaning of mail bags. In many countries bag-cleaning machines are used for this purpose (fig. 70). As already mentioned in the chapter on "General Outline of the Process of Modernization", the tables on which the mail is deposited can be provided with a suction apparatus to collect the dust raised when bags are emptied.

For the sorting of postal articles mechanical installations are in use which, although sometimes wrongly called mechanical *sorting* installations, serve to transport postal articles once they have been sorted into the pigeon-holes.

It should be realized that when such appliances are used, whilst at work the sorter is standing directly in front of moving conveyor bands, which throw up dust.

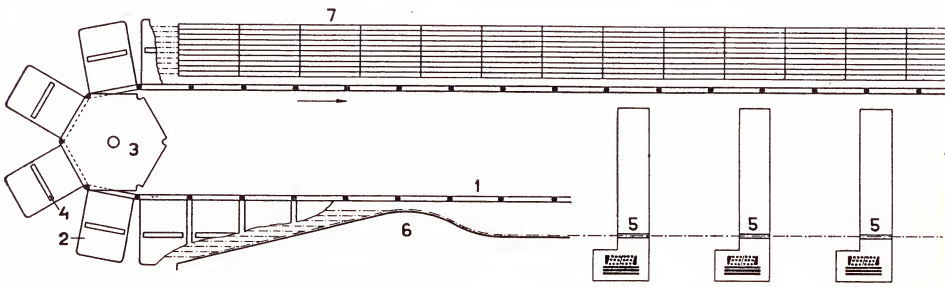
Dust causes discomfort in breathing and may lead to coughing, etc.; moreover, it may find its way into the bronchial tubes. It will be realized that even in apparently well-ventilated rooms a considerable quantity of dust is absorbed, when it is considered that an adult inhales approximately 500 l (18 cubic feet) of air per hour. A very large percentage of the dust inhaled, 75 to 90%, does not, however, reach the lungs, but is stopped by the nose filter, the vibrissae cells of the windpipe, etc. and exhaled. But the dust which does reach the lung vesicles gets via the tissue fissures into the lymphatic vessels, where it may give rise to tiny swellings in the tissue of the lungs. This generally causes coughing, expectoration and pain in the chest. Moreover, there is danger of the bacteria floating about in dust being inhaled too. This applies especially to tuberculosis bacteria.

The question naturally arises whether bacteria spreading contagious diseases are likely to infect postal workers through the transport and handling of mail. In medical circles opinion is divided on this point. It is generally held, however, that although letters and the packing material used may be sources of contagion, on the whole experience proves that this danger is not very great and most authorities no longer take any special measures for disinfection when handling mail from districts where contagious diseases are prevalent.

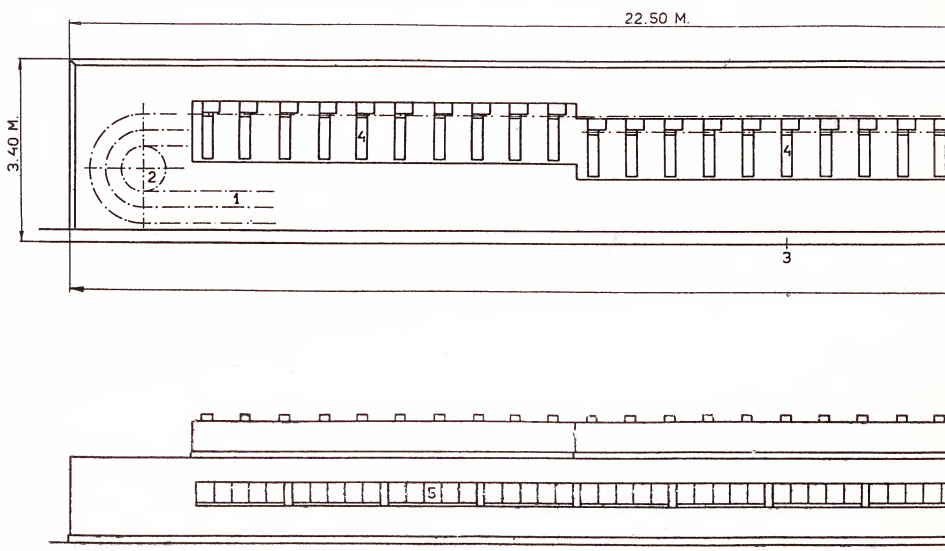


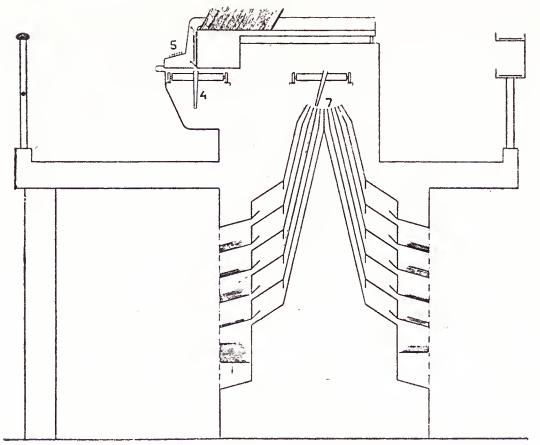
46. Emptying the Receptacles.

47. Diagram showing the operation of the Transorma Sorting Machine Type A 5/300.

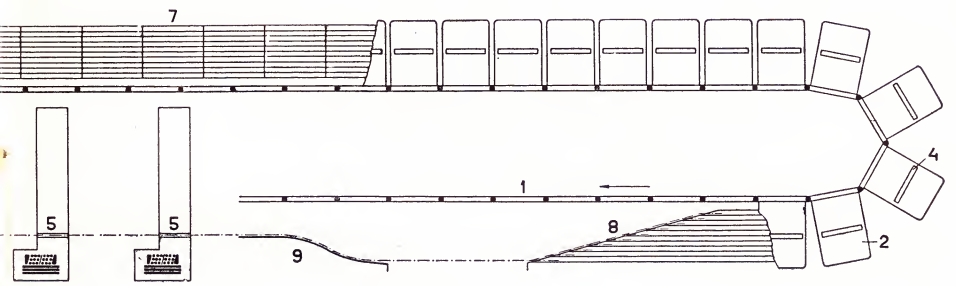


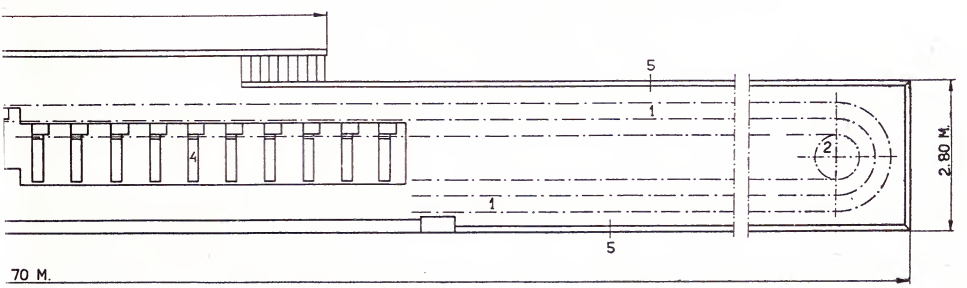
53. Diagram of a Transorma Sorting Machine Type A 30/300.

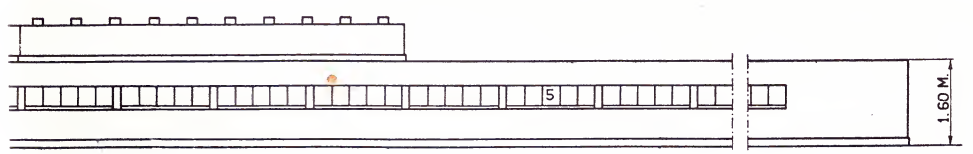




48. Cross section of the Keyboards of the Transorma Sorting Machine Type A 5/300.







This standpoint is justified by the fact that, as far as known, epidemics have never been conveyed by postal articles, however intensive the traffic may have been.

Ventilation and heating.

Not only should the buildings be clean; the right temperature and adequate ventilation should also be provided. Both these factors are closely related and this is certainly a task to be solved by architects and builders of offices; nor does this seem to be an easy matter, judging from the many buildings in which hardly any fresh air enters when the windows and doors are closed.

A building in which many people are at work should be provided with an installation that keeps rooms properly ventilated, making it possible to heat or cool the incoming air as and when required.

The heating of the rooms is also of great importance in countries where such is necessary in the cold season. Too high temperatures are as prejudicial to the working capacity of workers as those which are too low. The former cause drowsiness and are consequently apt to decrease output; the latter are equally undesirable.

It is difficult to indicate what temperature is required, as this depends on many attendant circumstances. In general it may be said that for rooms in which work is done sitting, this temperature lies between 18 and 20 degrees Centigrade (64° — 68° Fahrenheit); in the case of standing work, it may be reduced to about 15 to 18 degrees Centrigrade (59° — 64° Fahrenheit).

Lighting.

Lighting, both natural and artificial, is a matter of great importance. Good lighting, both during the day and in the evening, favourably affects the output of workers.

In particular the tables worked at should be properly lighted. As described in the chapter on "General Outline of the Process of Modernization", designers of the Transorma Sorting Installation have succeeded in furnishing the most practical and effective lighting where required for work.

Disturbing noises.

Disturbance from noise in rooms where sorting is done should as far as possible be avoided. It is sometimes asked whether the installation

of machinery and other contrivances does not constitute a retrograde step in this direction. But as regards the new Transorma Sorting Installations there is nothing to fear on this account. The machines are practically noiseless, being totally enclosed with a wooden encasement lined with a thick layer of celotex, a well-known sound-proof material. The noise made can hardly be called audible. Moreover, the sound is rhythmic and tends to exercise a stimulating influence on the operator's work, which adapts itself to the rhythm of the machine.

Still more effective sound-deadening can be obtained by covering the ceiling and walls of the sorting room with a noise absorbing preparation, such as celotex. Noise made by other machines, such as stamp-cancelling machines, which is not so easily insulated can be deadened in this way. Even with all these precautions, there still remains the problem of reducing the noise caused by the accumulation of a large number of employees who are occasionally obliged to speak to one another. The times at which mail must be ready for dispatch can better be announced by light signals than by shouting or loudspeaker. This would also prevent distracting others working in the sorting room who are not concerned with these signals.

Comfort.

Sorting by hand is done either on a table (the sorter being *seated*), or into a sorting case, the method now in general use (the sorter being obliged to *stand*).

After working at a sorting table in a sitting position for a long time at a stretch, the sorter, whose arms will be tired from reaching and stretching across the table, will try to support those parts of his body which are weary. He cannot rest his arms, for they have to do the work; he cannot lean his back against the back of his chair, because then he cannot cover the field of operation. Consequently, the trunk is allowed to sag, causing pain in the back, possibly a curvature of the spine or hollow chest, owing to the inclination to seek support by leaning against the table. This attitude is particularly harmful for female employees.

Whether the sorter is seated at a table or standing before a sorting case, one of the causes of fatigue is the position of the forearms. The left hand is obliged to go on holding a pile of letters breast-high, while the right hand is employed in depositing letters in different places (fig. 71).

The Transorma Sorting Machine eliminates this cause of weariness. The Transormist's right elbow is supported on a cushion, while the right hand drops letters one by one into the same slot, which merely entails a wrist action covering a distance that remains constant. The left hand rests on the keyboard. Contrary to sorting at a table, the work is done in a natural position. The operator is comfortably seated on a chair specially designed for the machine to eliminate all the disadvantages of sedentary work.

The seat, somewhat rounded in front like a saddle, is adjustable in height. The back is also adjustable and gives automatically with the movements of the back. The broad foot rest can be adjusted both as to height and angle. Care has been taken to provide sufficient room for the knees between seat and table. Attention having been paid to all these details, this method of working is preferable to standing work and affords an opportunity of employing the physically defective, besides making it possible to engage women operators without objection.

When sorting has to be done standing up, a strain is put upon the various muscles of the back, pelvis and legs, which must inevitably tire the sorter, thereby making it unadvisable to employ anyone with even a slight physical disability, or women in general.

Foot defects.

One of the most frequent ailments due to prolonged standing and walking, the cause of which is eliminated by the introduction of the Transorma Sorting System, is the flat foot.

Normally the tension of muscles holds the foot in position. When muscles are over-exerted owing to prolonged standing, this tension is relaxed and too great a strain is imposed on the ligaments between the various bones of the foot which are consequently stretched and no longer able to hold the bones in proper place. Then the instep begins to sag. Once this trouble is started, it is apt to become worse since the muscles are no longer able to resist the normal pressure imposed on them (fig. 72).

Once a person is flat-footed, the difficulties are great. Early tiredness when walking and standing, pain in various places, for instance on the inner side of the foot, in the ankle, calf or hip are some of the many complaints. If the sufferer has to stand or walk the whole day long, there is little chance of this ever being cured.

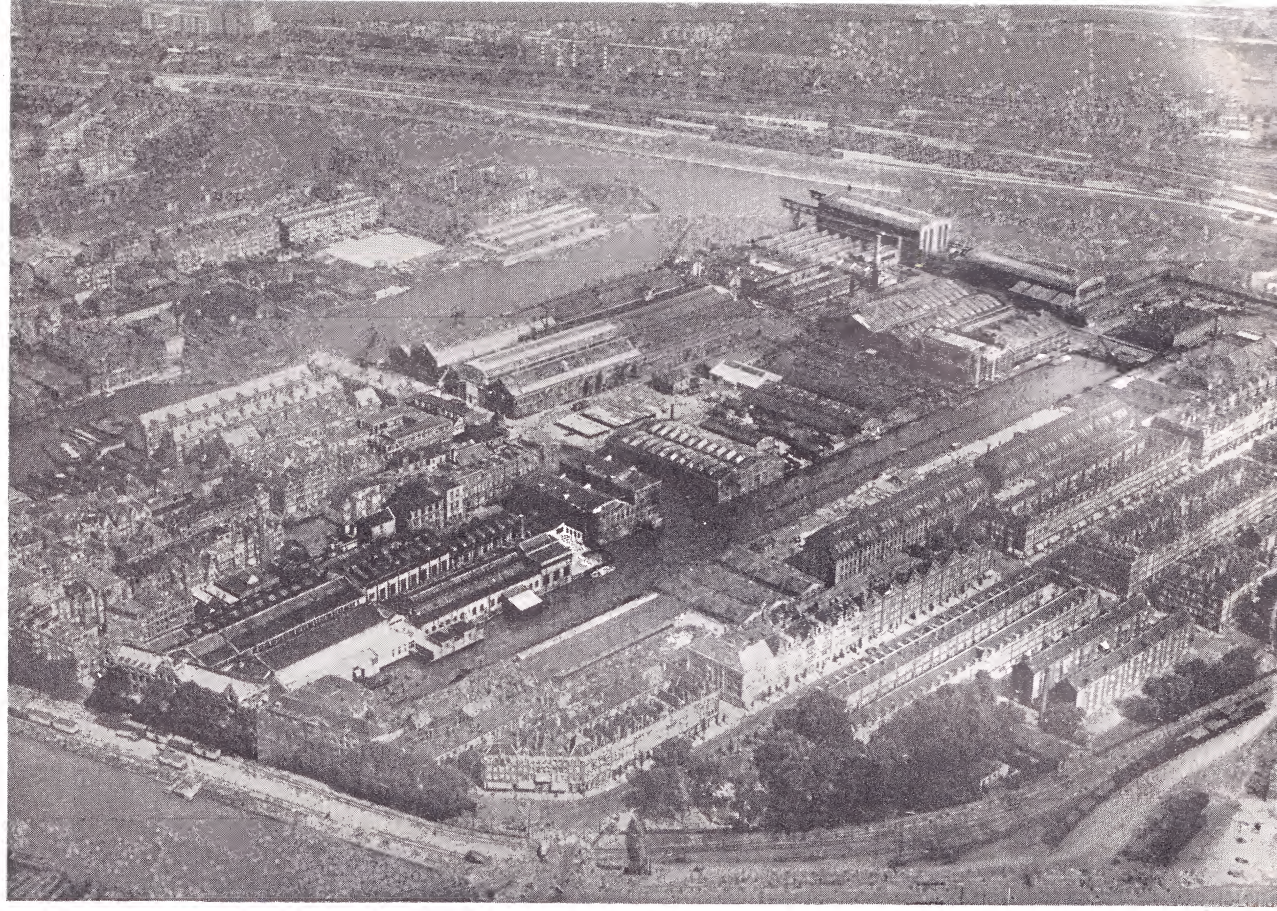
Those suffering from or predisposed to varicose veins should avoid standing work, as this aggravates their trouble. Here, too, the Transorma Sorting System provides relief.

Perspiring feet are often a consequence of flat feet. This is an unpleasant ailment, not only for the person concerned, but also for his colleagues. It spreads an unbearable odour and therefore might even be said to constitute a social problem in the sorting rooms.

The tiring movements necessitated by hand sorting also cause much secretion of sweat in the arm-pits. The necessity of constantly raising the right arm during the process of sorting by hand spreads this unpleasant odour in every direction.

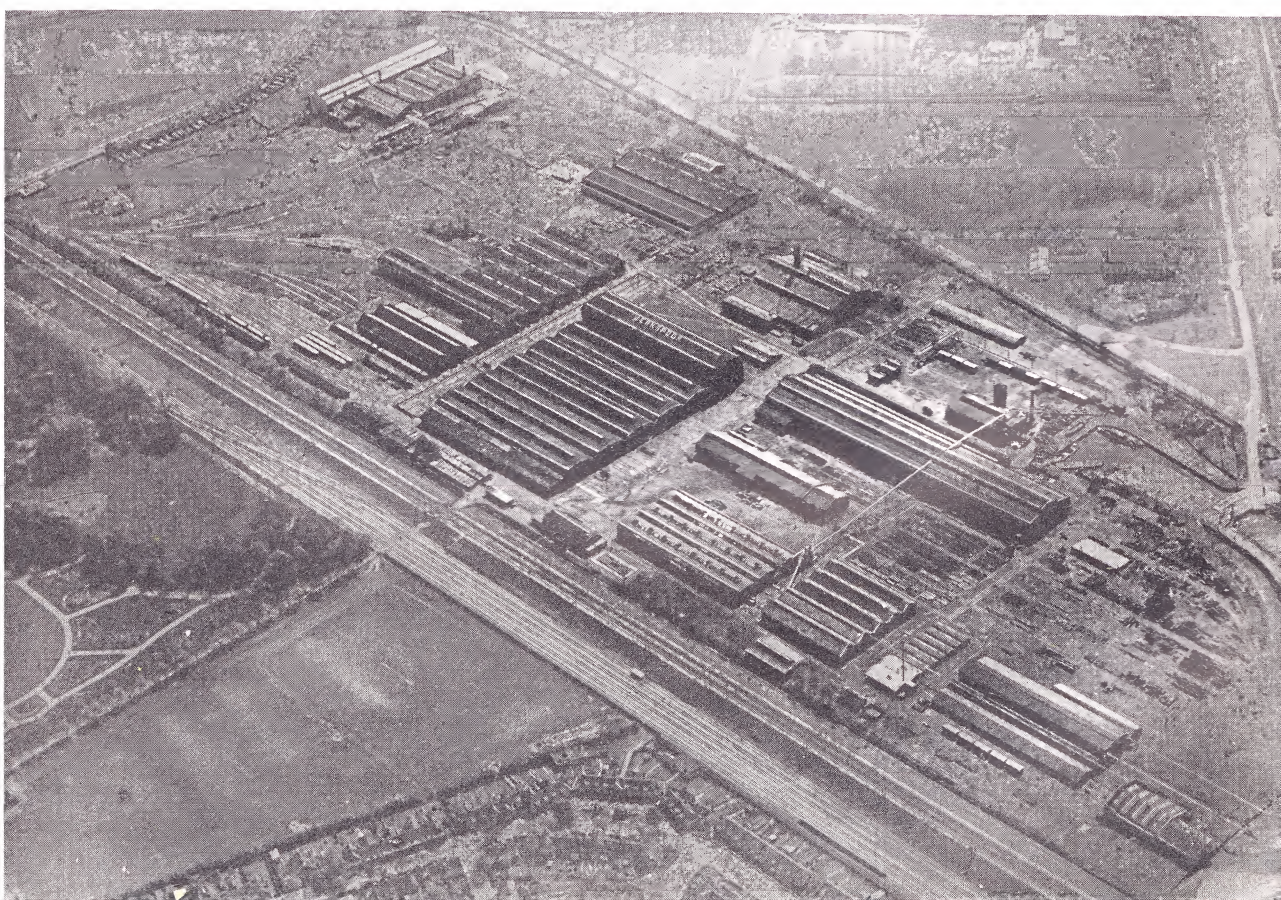
Here again mechanical sorting as effected by the Transorma Sorting System is an improvement. The operator is comfortably seated whilst at work and the movements required of him are not many.

It is in the interests of post office employees to have the service mechanized and modernized, because then fewer demands are made on their physical and mental powers of endurance and this automatically tends to improve their social position.



73. Werkspoor Engineering Works at Amsterdam.

74. Werkspoor Carriage and Bridge Factory at Utrecht.



CHAPTER VIII

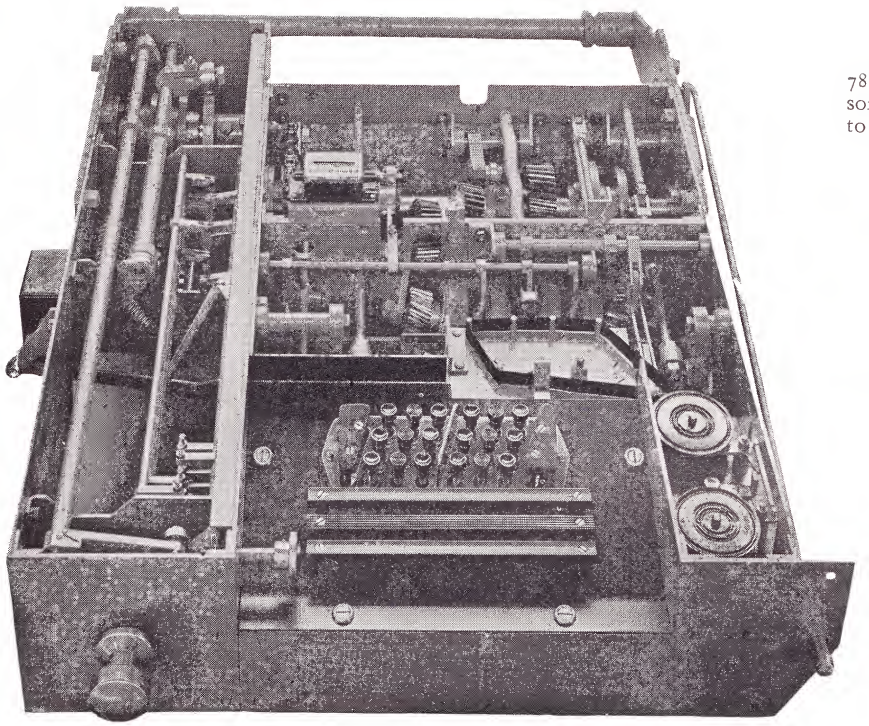
MANUFACTURING CENTRE FOR TRANSORMA INSTALLATIONS

The engineering works Werkspoor Ltd., Amsterdam, with which the Marchand-Andriessen Engineering Co. Ltd., The Hague, works in close co-operation, are the successors of an undertaking founded in 1827.

On the 9th of February of that year Mr. Paul van Vlissingen, one of the pioneers of the Netherlands engineering industry, rented what was left of the buildings on the site where the East India Company had formerly built their ships, in order to establish there a smithy and repair shop for marine engines.

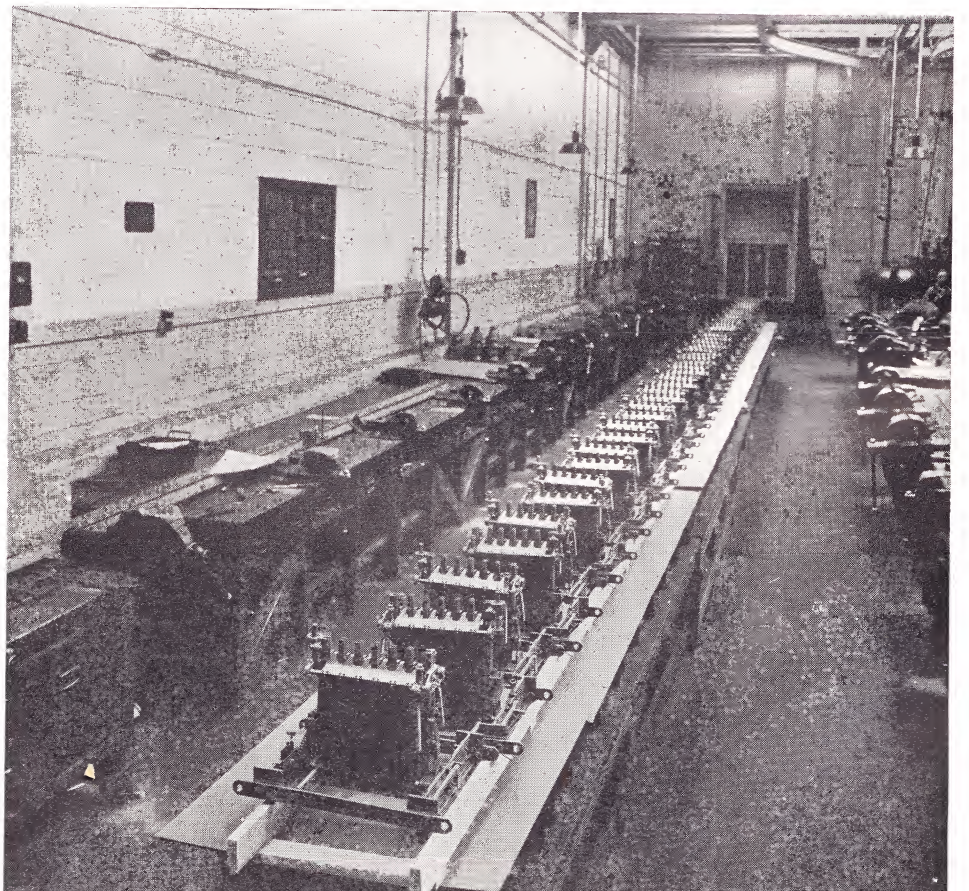
During the approximately hundred and twenty years which have since elapsed, this factory has been worked without interruption. There have been difficult years — on several occasions serious fires broke out in the buildings — but obstacles were invariably overcome and the workshops and plant have been steadily extended and modernized. Starting in 1827 with thirty employees, the concern now has at its disposal approximately seven thousand hands, two modernly equipped manufacturing sites, viz. the Engineering Works at Amsterdam (area 14 hectares or 35 acres) (fig. 73) still situated on the site formerly occupied by the East India Company and the Carriage and Bridge Factory at Utrecht (area 30 hectares or 75 acres) (fig. 74), built there in 1913, when the Amsterdam site became too small. The Werkspoor factory at Amsterdam has in the first instance always been a general engineering works and only of late years it has begun to show a tendency towards specialization in, for example, Diesel engines, plant for sugar factories, ship's turbines, steam boilers and pumps for draining installations and — what will be of most interest to the reader — Transorma Postal Sorting Machines and Transorma Bundling and Sealing Machines "B.S.M.".

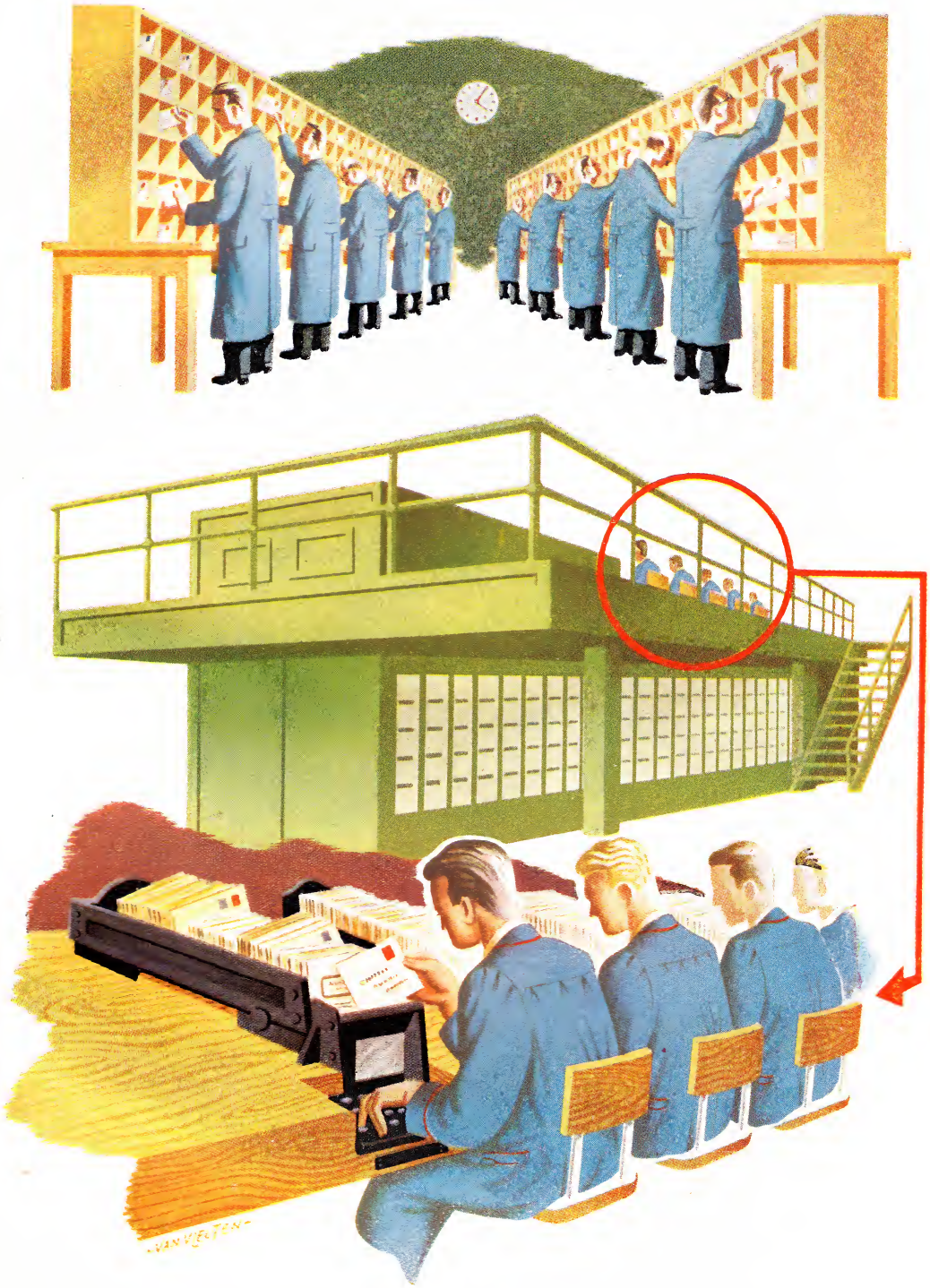
The Carriage and Bridge Factory, as its name indicates, builds rolling stock for the railways, such as passenger carriages, mail and luggage vans and goods trucks, as well as bridges and other iron structures, used, for instance, for buildings.



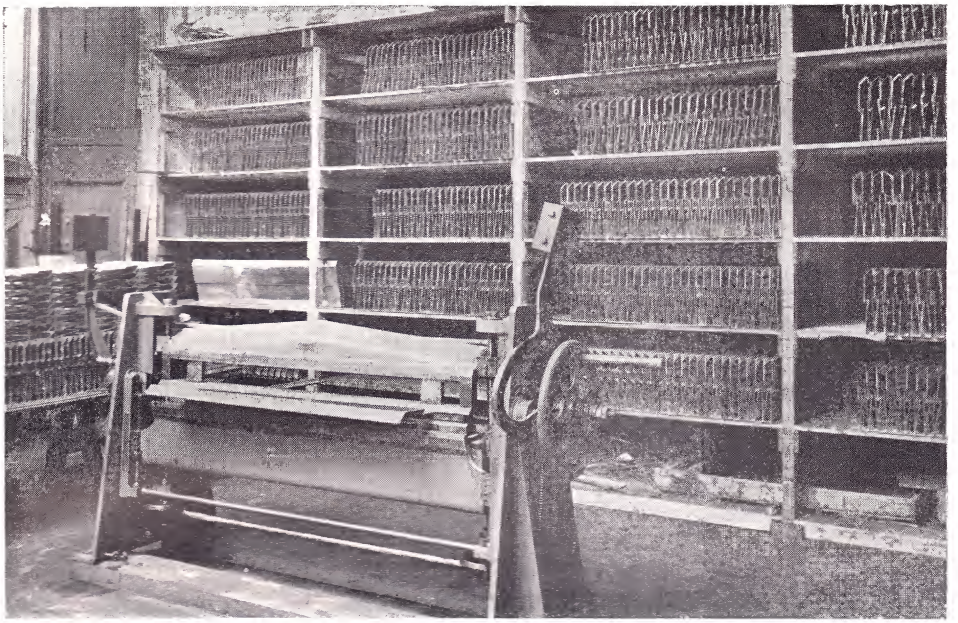
78. The Keyboard of a Transorma Sorting Machine ready to be built in.

75. Mass production of the Letter Carriers for Transorma Sorting Machines.



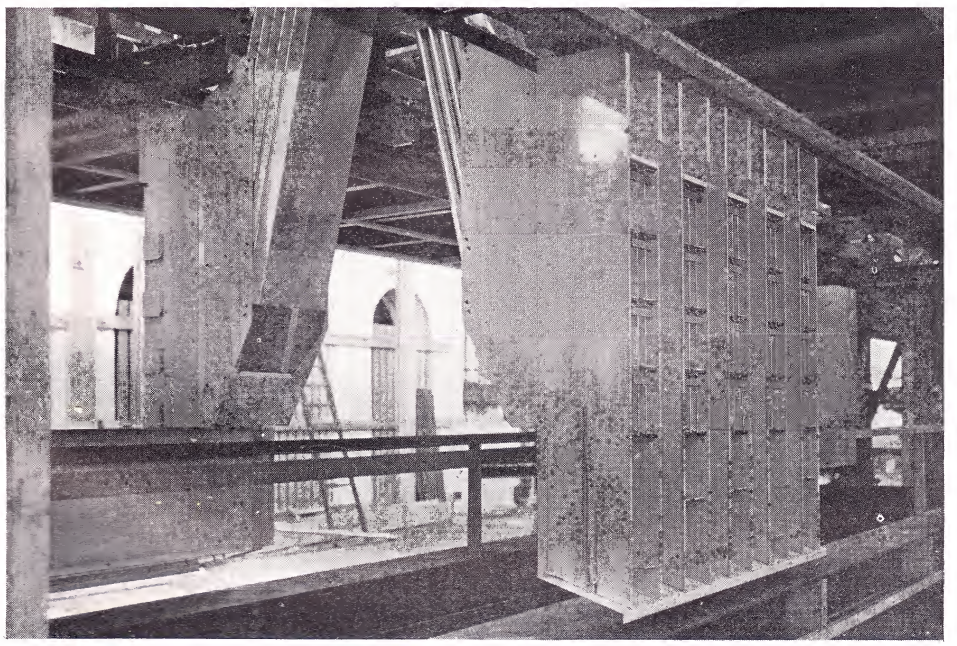


71. The fatigue resultant from sorting by hand. The comfortable, natural position of Transorma operators.



76. Letter Chutes for Transorma Sorting Machines.

77. The fitting-up of Receptacles and Chutes.



Since its foundation in 1827 the export market has attracted the successive directors of this concern, who have kept in touch with oversea customers by means of personal visits. Large orders have been executed in the course of years for the Netherlands East and West Indies, Great Britain, Italy, Egypt, South Africa, Russia, Australia, the Argentine, Brazil, China, Japan, India, Iraq and many other countries.

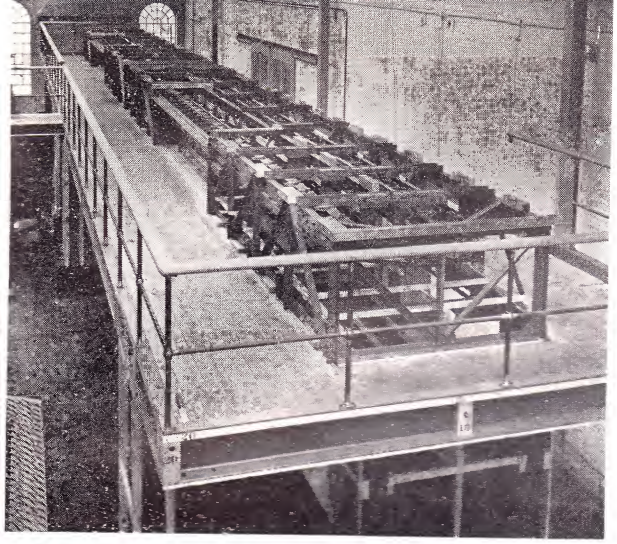
Old, still working engines, dating from the past century, sometimes found in unexpected places, bear testimony not only to the spirit of enterprise with which the management has always been imbued, but also to the soundness of the material used and the zeal and devotion with which the Amsterdam workman carried out the work entrusted to him.

The co-operation between Messrs. Marchand-Andriessen and Werkspoor Ltd. dates from the year 1930, when Werkspoor built for Marchand-Andriessen the first complete Transorma Installation for the General Post Office at Rotterdam. Shortly after this machine was brought into use, a contract was concluded granting Werkspoor Ltd. sole manufacturing rights for the Transorma Postal Sorting Installation in the Netherlands. Later on, after the invention of the Transorma Bundling and Sealing Machine "B.S.M.", a similar contract was signed in respect of this machine.

In the course of years as more and more machines were built (figs. 75—80) and installed jointly, the co-operation between the two Companies has grown closer (fig. 28). In 1942 it was decided to revise the relation laid down in the original contracts, both as regards the Transorma Postal Sorting Machine and the Transorma Bundling and Sealing Machine.

Under the arrangement now in force, Marchand-Andriessen Ltd. have transferred world rights for the manufacture and sale of these machines to Werkspoor Ltd., the latter undertaking to do all that is necessary to promote their sale at home and abroad. At the same time Werkspoor Ltd. have been given the sole right to conclude licence contracts for the manufacture of the Transorma Postal Sorting Machine and Transorma Bundling and Sealing Machine "B.S.M." (fig. 81).

Thus Werkspoor Ltd. has acquired sole licensing rights for abroad and can be counted on for the close co-operation which the building of such machines requires both as regards their use, as well as design and manufacture.



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79. A Transorma Sorting Machine, partly mounted.

80. A Transorma Sorting Machine, after mounting has been completed.

81. A series of Transorma Bundling and Sealing Machines "B.S.M." ready for dispatch.

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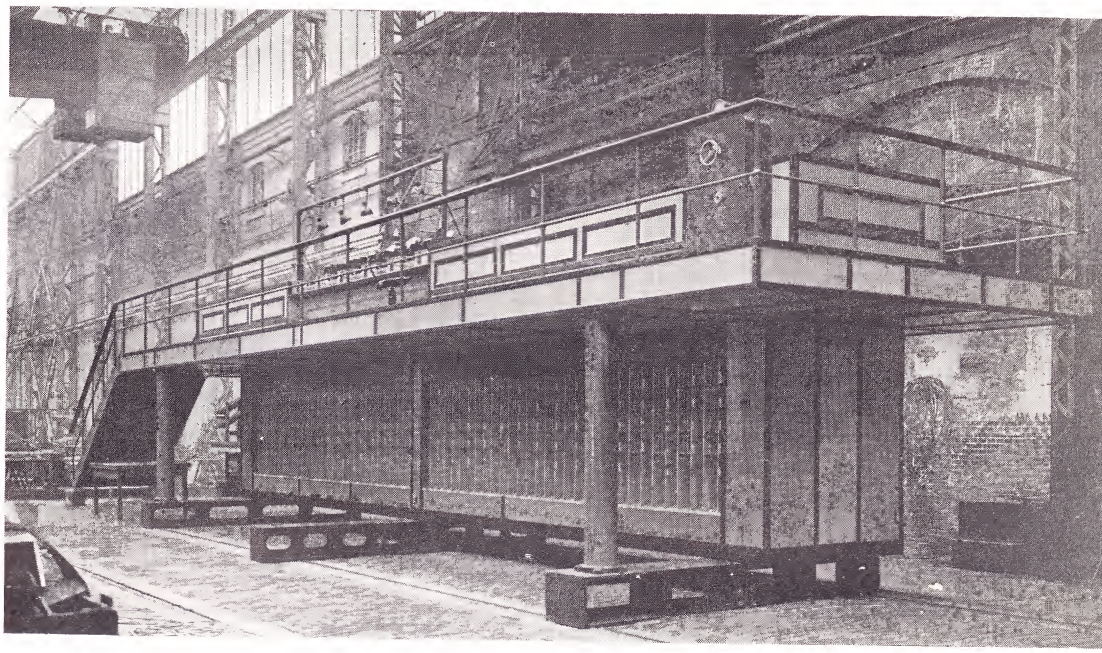

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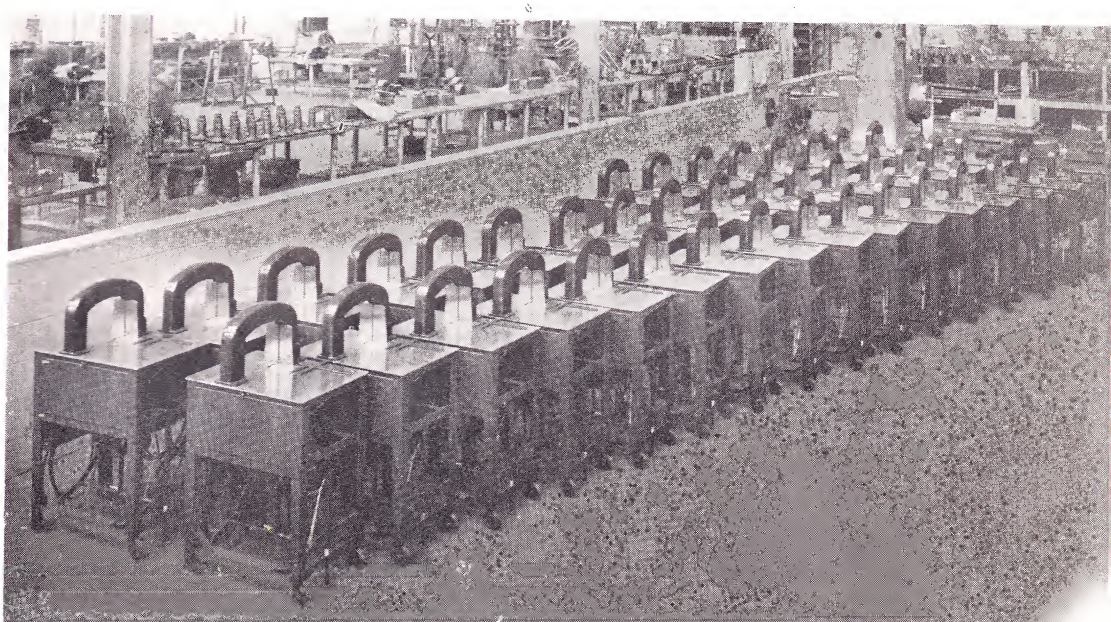

All new uses, improvements in design and simplifications in manufacture are brought to Werkspoor's notice and they in turn see that licencees are kept fully informed of all developments.

Marchand-Andriessen Ltd. can now devote all their attention to further developments in the mechanization of the Postal, Postal-Cheque and other Services and all the postal and technical problems connected therewith. Consequently, they undertake all the preliminary work relating to the mechanization of sorting services, such as, for instance, collecting the necessary data to judge whether and if so, what type of sorting machine is to be recommended in a given case and comparing the results obtainable with and without such a machine.

Experience has taught that the managements of the Postal and Postal-Cheque Services often apply in the first instance to Marchand-Andriessen Ltd. for information about the postal side of mechanization before entering into negotiations with the makers for purchase of an installation.

Finally, Werkspoor's entire export organization, consisting of technical agencies in many countries, is available for the publicity, sale and service of the Transorma Machines.

A happier combination than this, of the inventor's office with its postal and technical experts on the one hand and the engineering firm with almost a hundred and twenty years' experience in the building and exportation of machinery on the other, would certainly be hard to find.

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